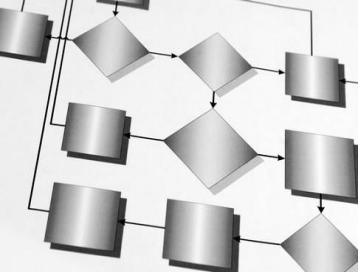
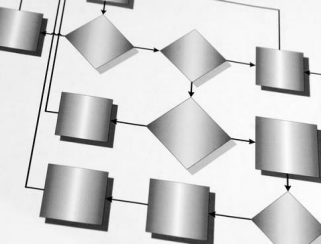


OACC Symposium

Storytelling with data:
Advanced graphing techniques including best practices in infographics and data visualization

November 14, 2014

Gregory M Stoup
gstoup@4cd.edu
Sr. Dean Contra Costa Community College District
Vice President, RP Group of California



Presentation overview

Part I

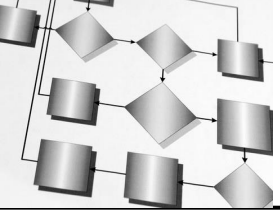
10:45 – 11:35

1. Why story telling?
2. Why visuals?
3. Story-based messaging through visuals
4. More than a few examples

Part II

12:40 – 1:30

5. Guidelines for building an effective visual
6. Designing visuals for greatest impact
7. Walking through the process



The power of story

Data and facts will motivate only a small minority of people to act

Our brains are hard wired to seek out narrative

*"Story telling is mankind's single most powerful communication vehicle … **humans are primates that tell stories**"*

-Stephen J. Gould

Jettison the bad advice from the past

We've been told: Redundancy is the key…

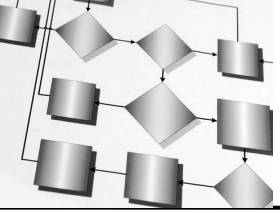
"Tell them what you're going to tell them, tell them, and then tell them what you just told them."

"The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information"

- cognitive psychologist George A. Miller

Actually this is good advice when your giving people a bunch of boring facts that they don't care about

A better approach: walk them through an engaging story

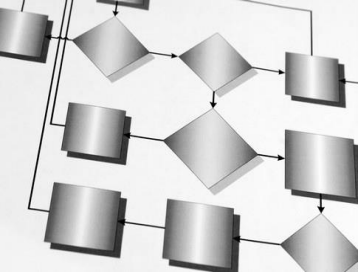


The problem with facts

- The backfire phenomenon

- When exposed to facts that conflict with an individual's closely held beliefs, the introduction of conflicting data actually reinforces the pre-existing beliefs.

- A compelling story has a greater likelihood of triggering thoughtful reflection than data alone



Furthermore, the slow pace of progress in student success is not for lack of data

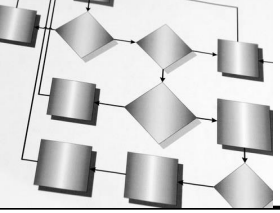
THE CHRONICLE
of Higher Education

November 4, 2010

It's Not How Much Student Data You Have, but How You Use It

By Sara Lipka

Student-assessment reports feature tables, charts, and shining examples of data in action. According to this year's National Survey of Student Engagement, released on Thursday, the University of Nevada at Las Vegas had seen low marks for advising, so it opened an academic-success center. South Dakota's public colleges, worried about weak measures of "active and collaborative learning," had made plans for all students to get tablet PC's, and for faculty members to integrate them into coursework.



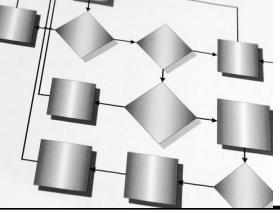
Reporting findings vs messaging

• Getting people to reflect and ultimately act on your data means getting a lot of things right.

• Today we will not be focusing on visuals as tools to further the research investigation.

• We will be looking at visual tools to help convey ideas and stimulate reflection.

"We are moving past the traditional practice of reporting findings to thinking about how we craft effective messages & build compelling stories"



First, let's identify a common language

Standard SAS output for the T-Test Procedure

To the outsider, researchers

Because researchers fully appreciate the complexities and subtle nuances of their research they are often tempted to linger there.

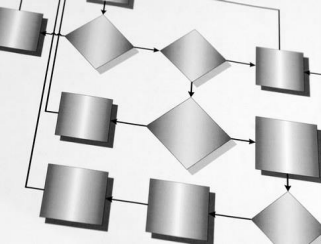
The T-Test Procedure **Statistics**

Variable	female	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err

Variable	Method	Variances	DF	t Value	Pr > |t|
Write	Pooled	Equal	198	-3.73	0.0002
Write	Satterthwaite	Unequal	170	-3.66	0.0003

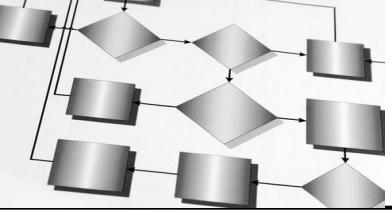
The wrong format can create dissonance between your message and your audience.

Variable	Method	Num DF	Den DF	F Value	Pr > F
Write	Folded F	90	108	1.61	0.0187



Presentation overview

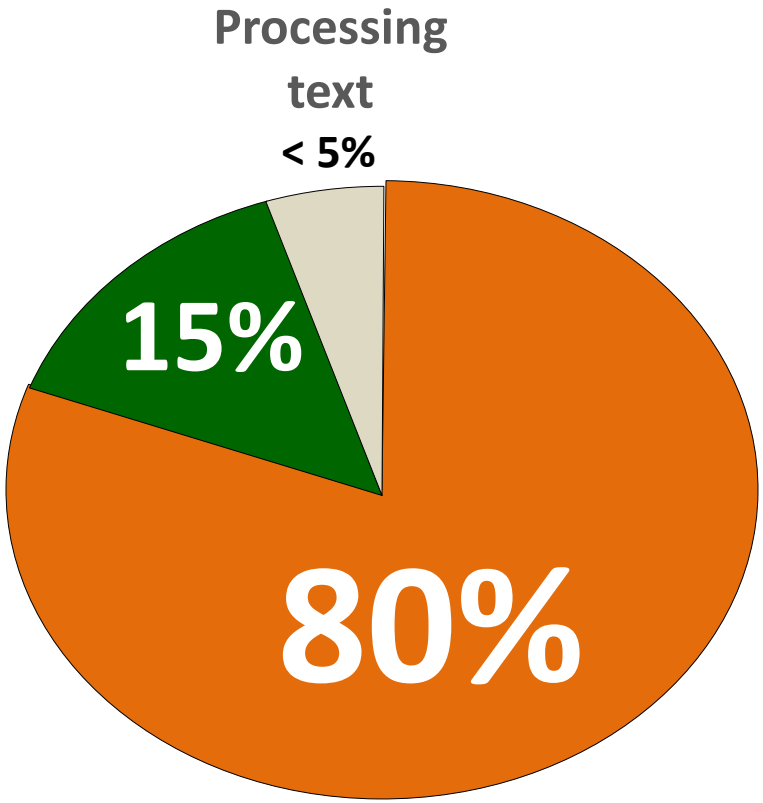
1. Why story telling?
2. **Why visuals?**
3. Story-based messaging through visuals
4. More than a few examples
5. Guidelines for building an effective visual
6. Designing visuals for greatest impact
7. Walking through the process



Why visuals?

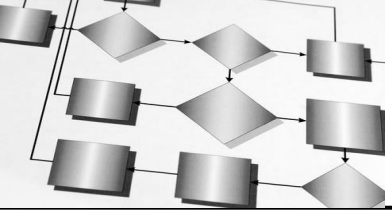
How your brain divvies up tasks

Processing audio information



Processing visual information

Source: Nancy Duarte, Resonate: Presenting Visual Stories that Transform Audiences (2010).

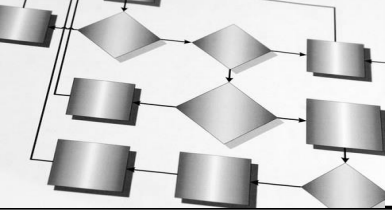


Successful Visualizations

- Are less about effectively conveying complex information than creatively provoking human interaction/thinking

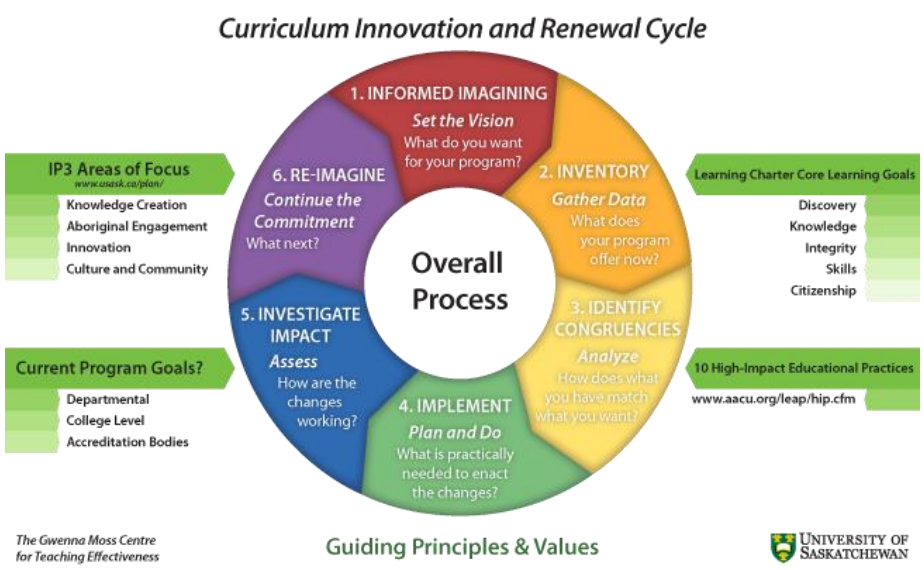
- Create situational awareness and contexts that otherwise were abstract or didn't exist

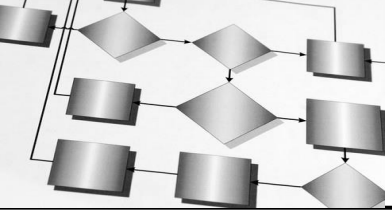
- Serve as compelling invitations to interact both with the material and with others



Elegance may not be enough

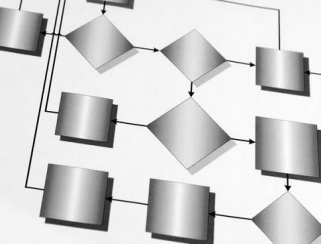
Eye-pleasing visuals, while enjoyable to look at, can fail to communicate a clear message …





Visuals that work

- All good visuals, whether they contain data or not, **tell a story**
- It may be a supporting story to a larger narrative, but a good visual is itself a stand-alone story
- We are looking to create a memorable summary of a compelling story



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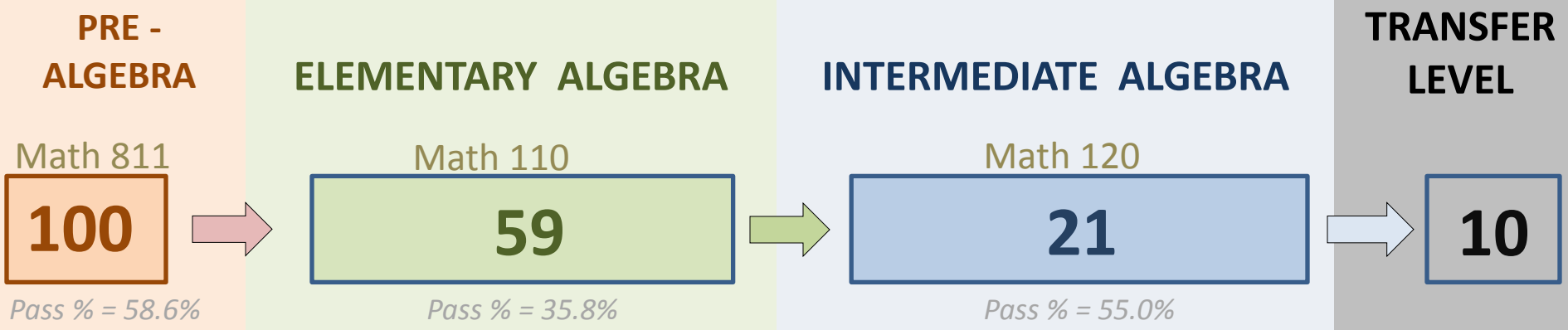
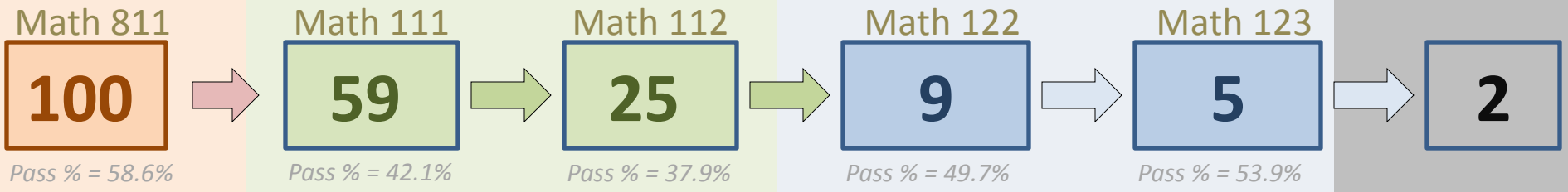
This will be our reference visual for much of the day

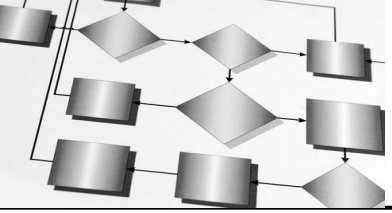
Given 100 students starting in Pre-Algebra, how many will reach transfer level math?

Short Sequence



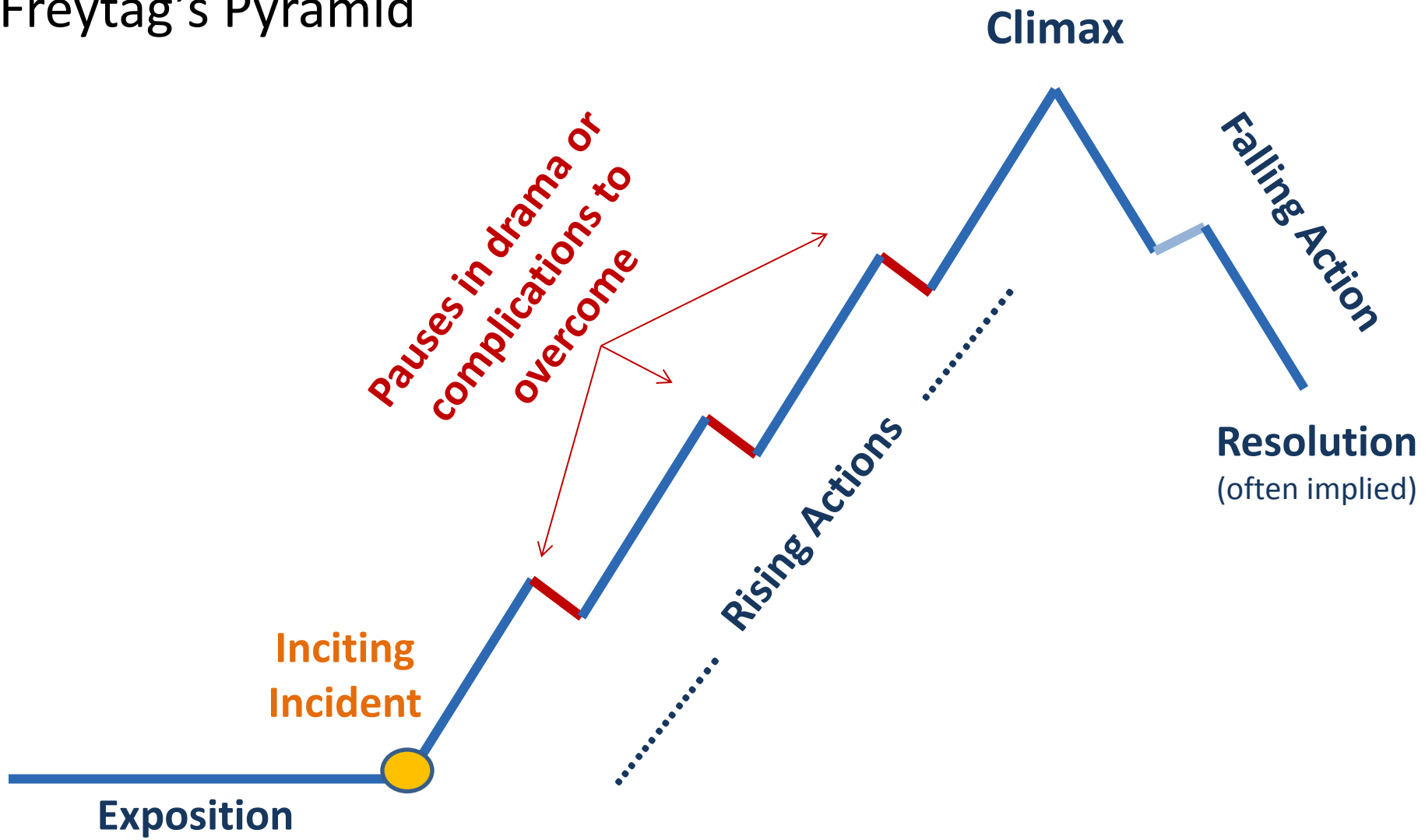
Long Sequence





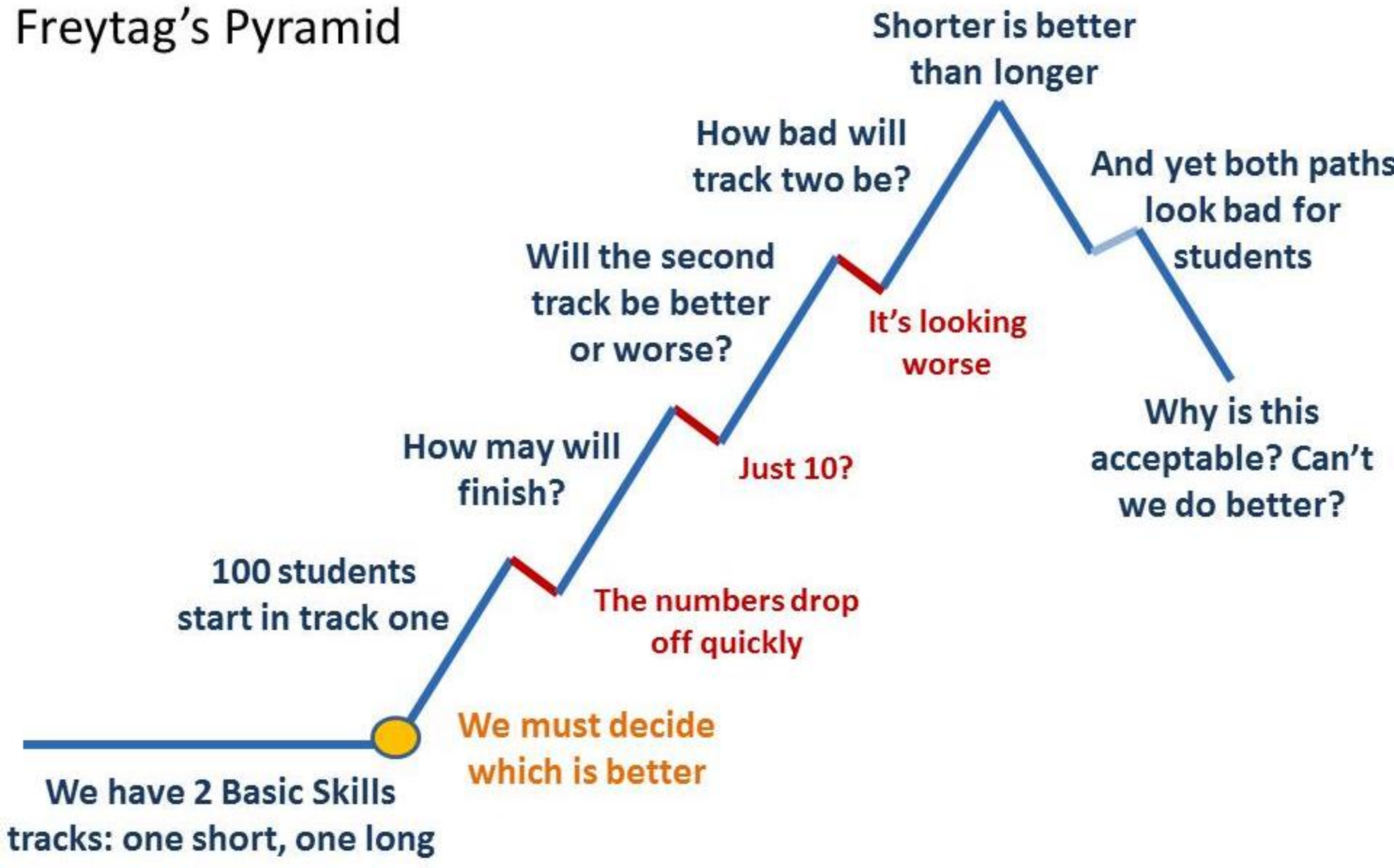
The art of storytelling

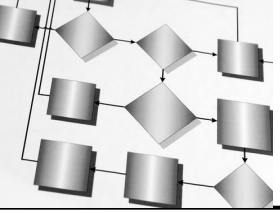
Freytag's Pyramid



Source: Cliff Atkinsin, Beyond Bullet Points and the Backchannel (2009).

Freytag's Pyramid illustrated: Short vs Long Sequences





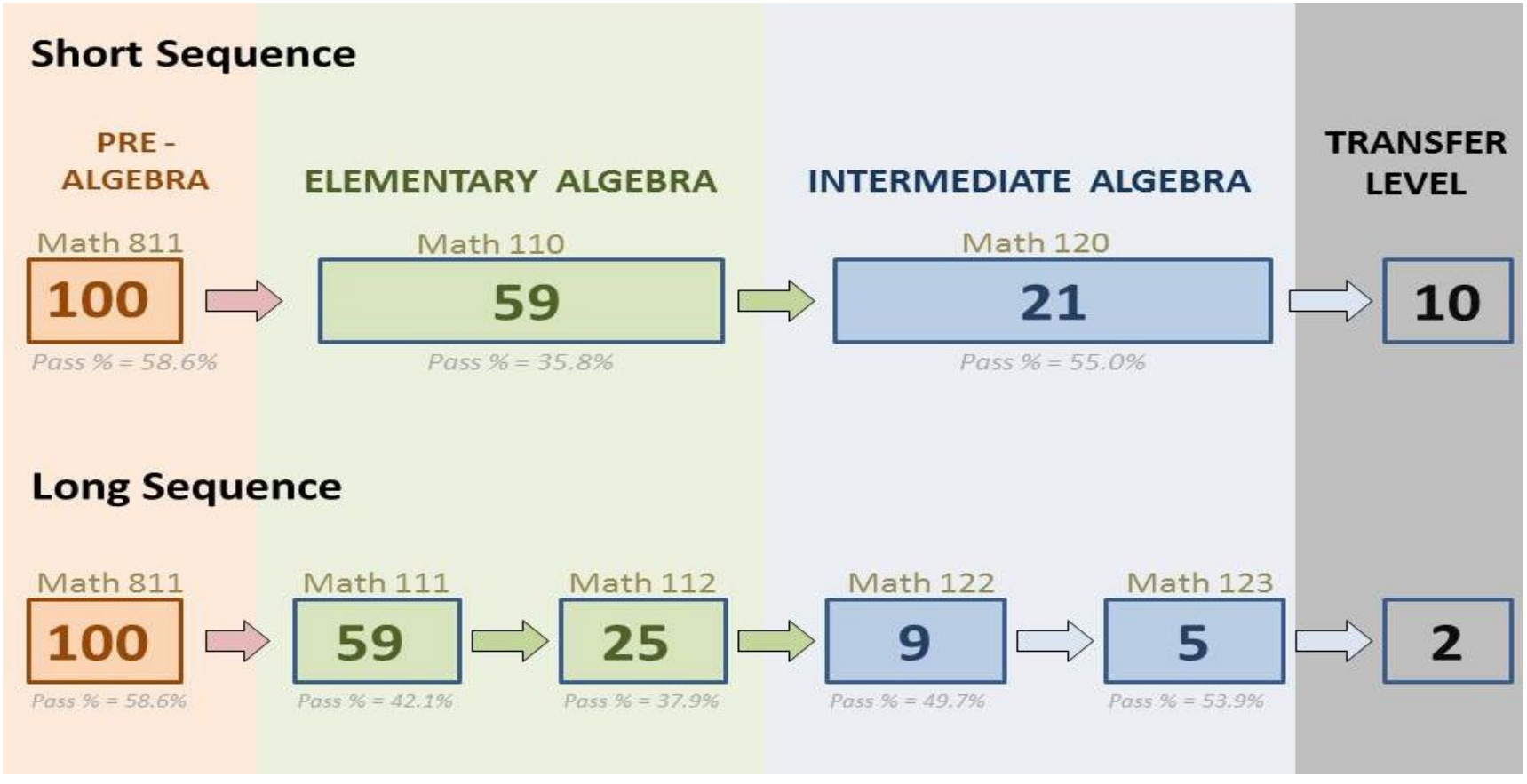
Developing messages that stick

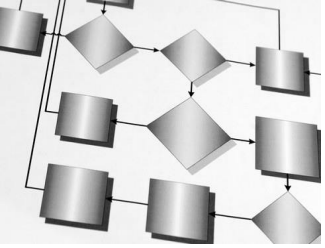
People tend to have highest levels of message engagement & retention when the ***story*** is:

1. **Simple** - *Can be easily summarize in a sentence.*
2. **Unexpected** - *Provides viewers a drama* ***they want to retell***
3. **Concrete** - *has few abstractions*
4. **Plausible** - *passes the sniff test*
5. **Emotional** - *speaks to things humans care about*

Source: Chip Heath & Dan Heath, Made to Stick: Why Some Ideas Survive and Others Die, Random House; 1 edition (2007).

1. **Simple** – When it comes to course sequences, shorter is better than longer
2. **Unexpected** – wow, shorter is a lot better than longer (and shorter kinda sucks)
3. **Concrete** – it's about students trying to complete a course sequence
4. **Plausible** – more courses means more work, more time and so fewer finish
5. **Emotional** – we are losing so many student





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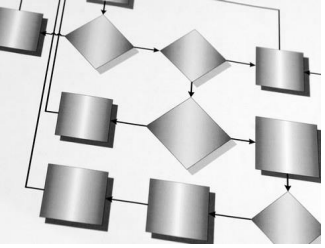
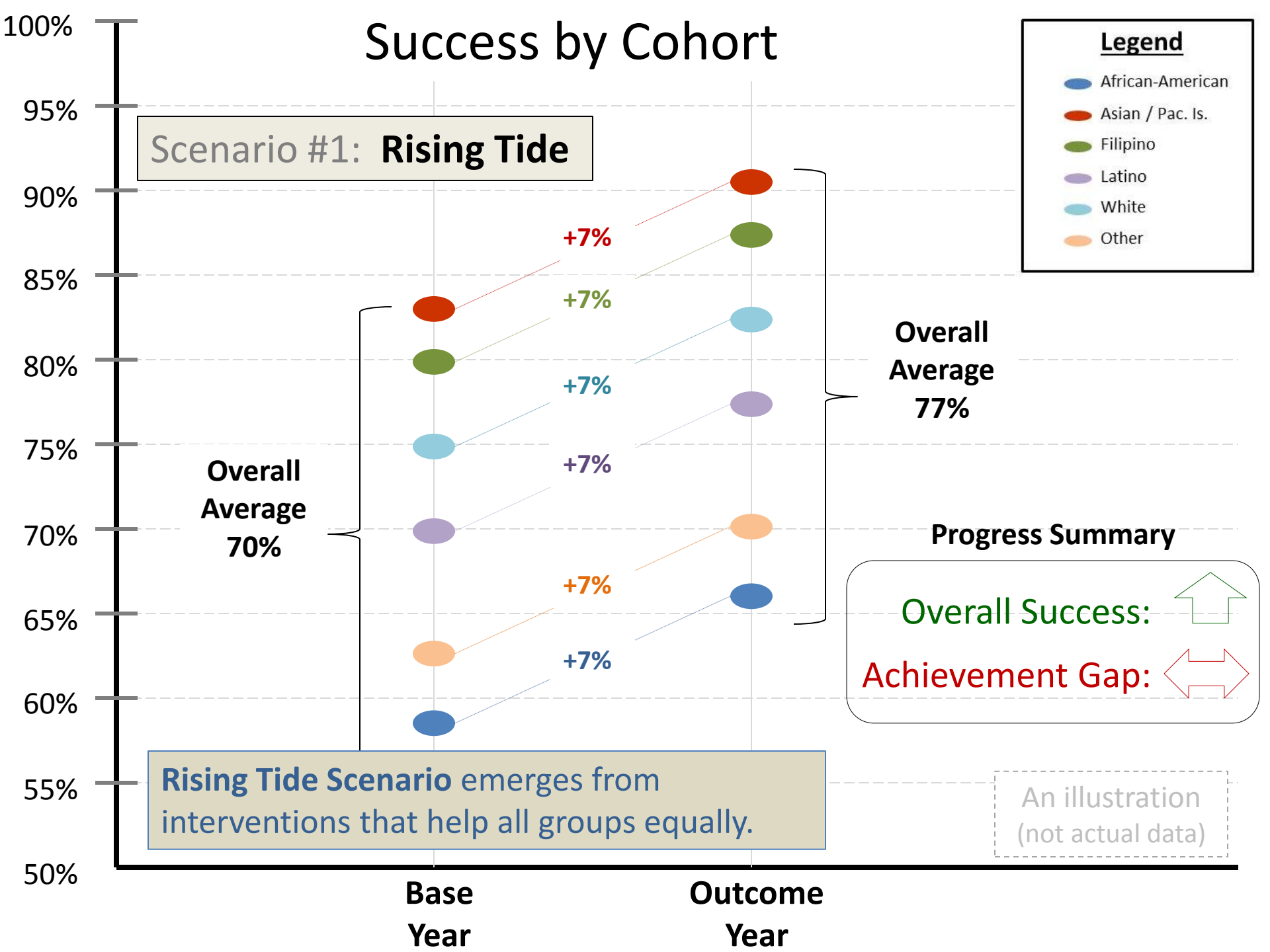
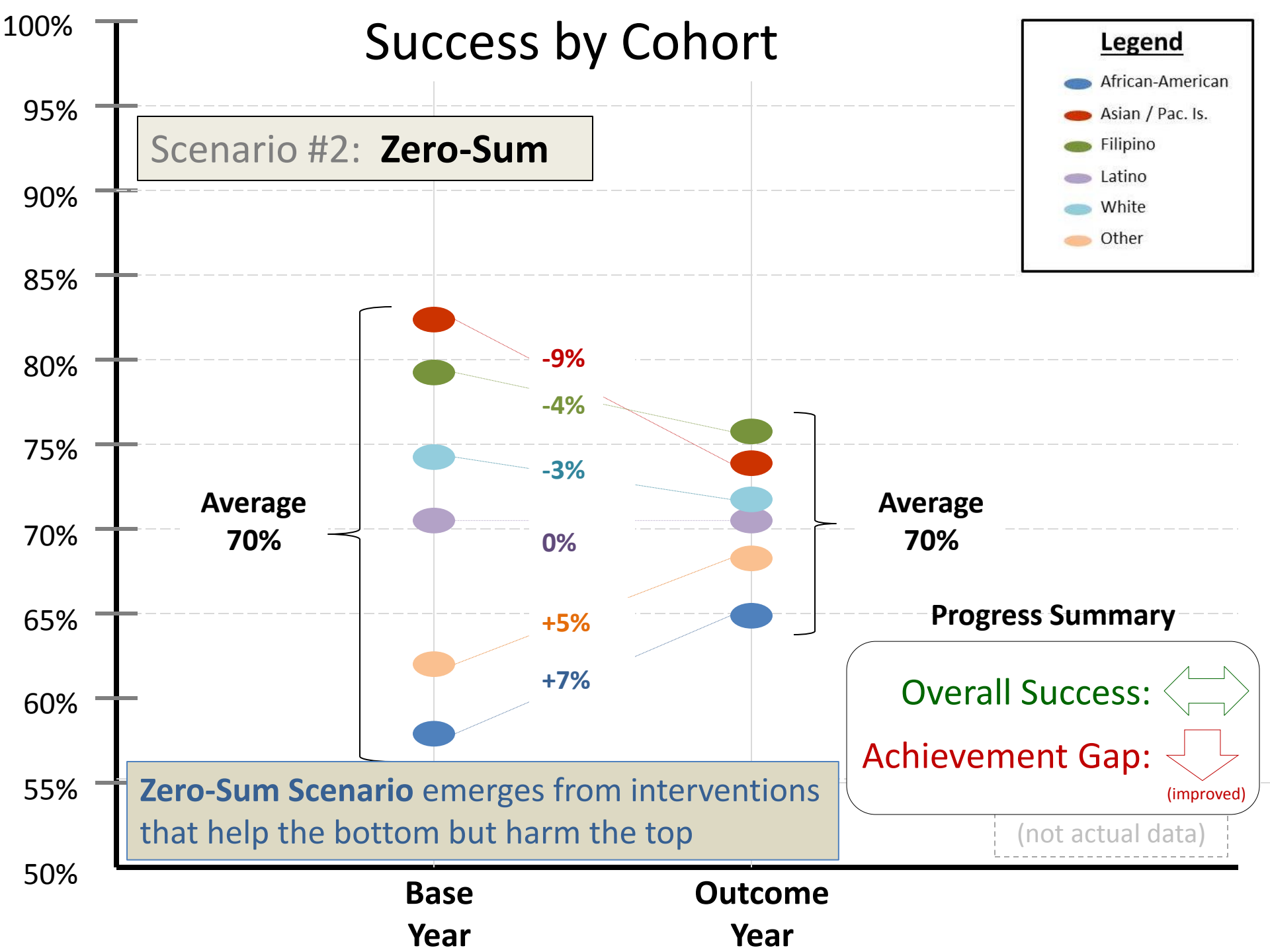
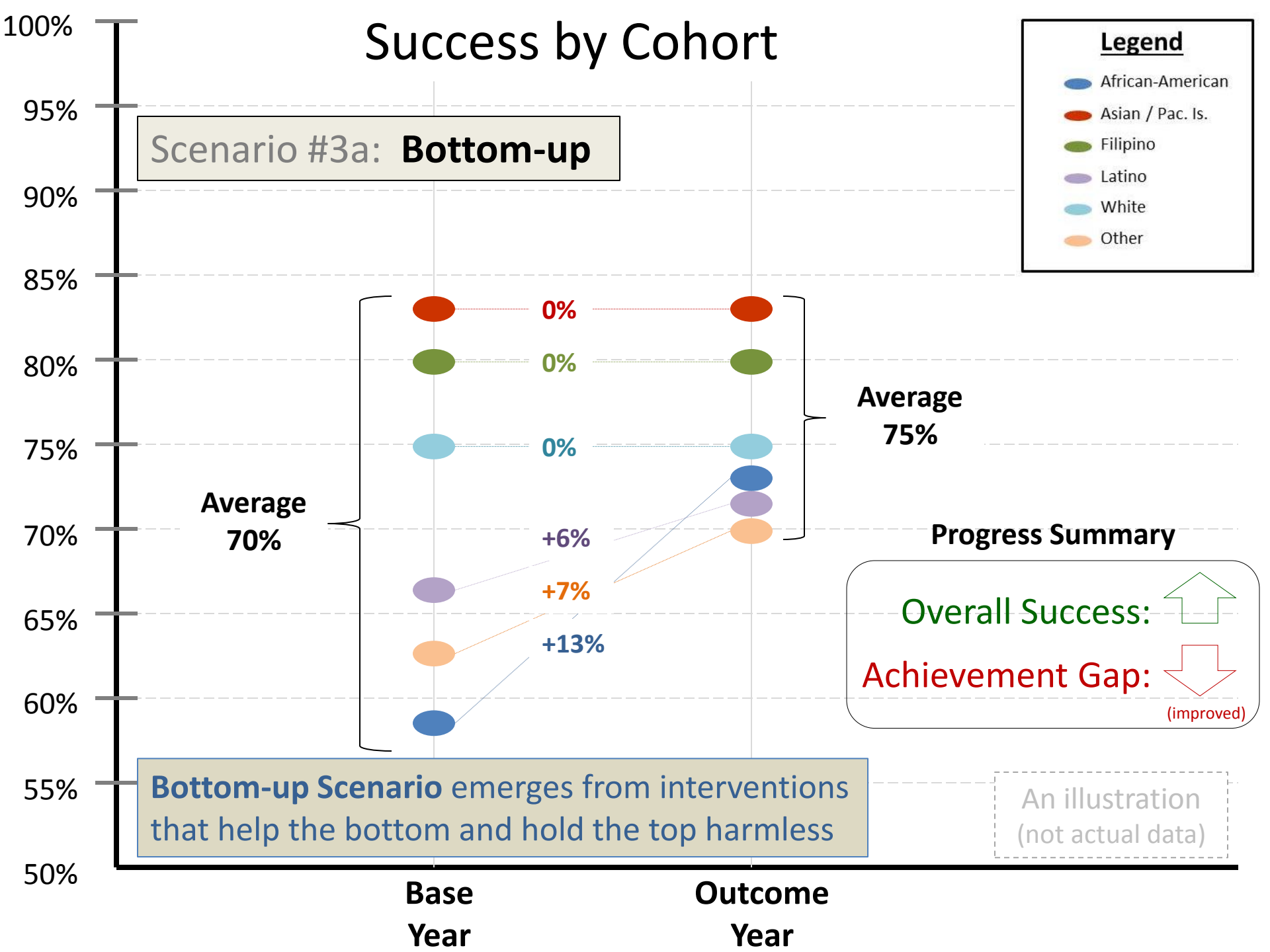


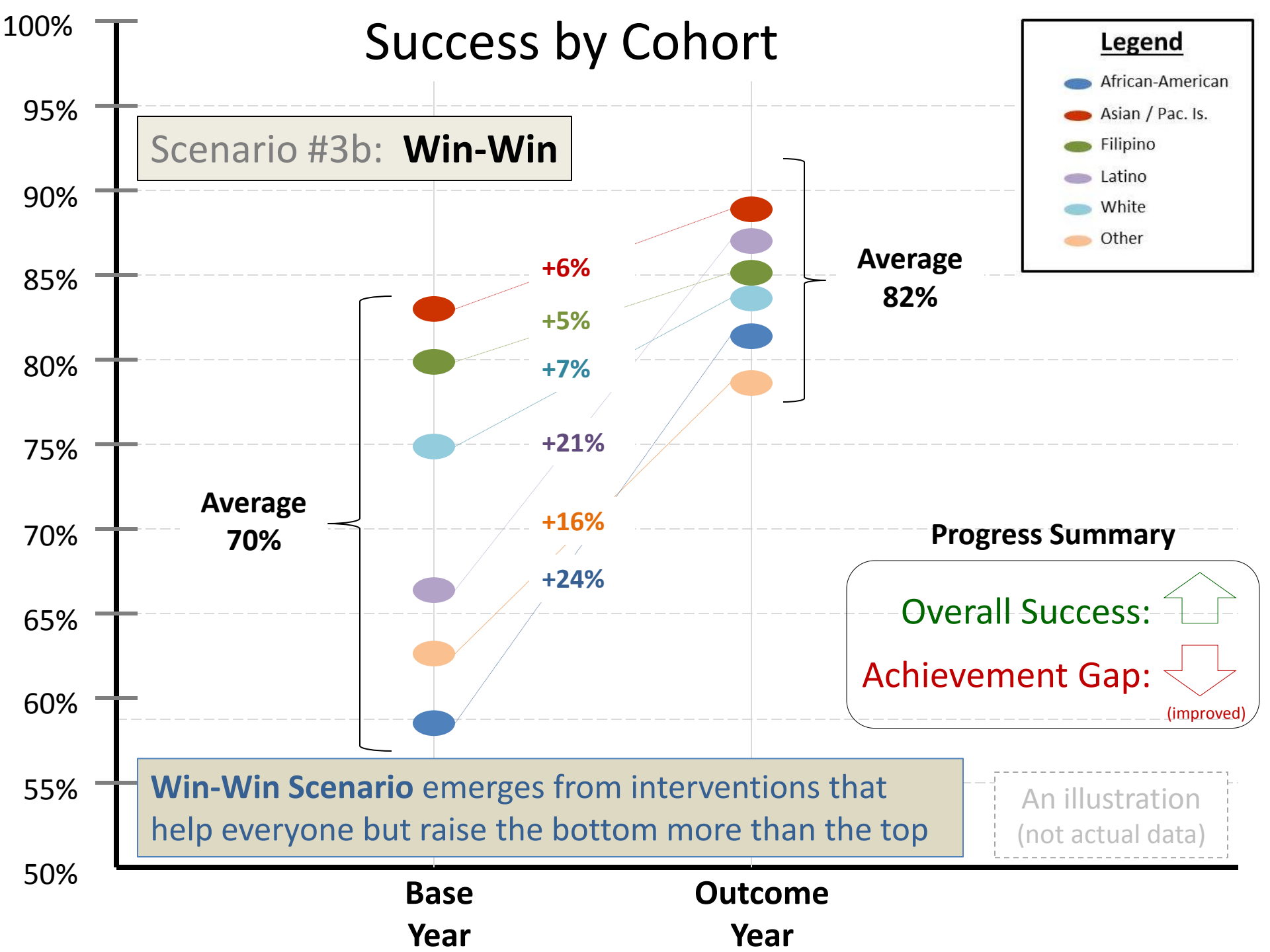
Examples: story #1

How should we think about equity with regards to student success?


Success by Cohort
Scenario #1: Rising Tide
Legend
African-American
Asian / Pac. Is.
Filipino
Latino
White
Other
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
+7%
+7%
+7%
+7%
+7%
+7%
Overall Average 70%
Overall Average 77%
Progress Summary
Overall Success:
Achievement Gap:
Rising Tide Scenario emerges from interventions that help all groups equally.
An illustration (not actual data)
Base Year
Outcome Year


Success by Cohort
Scenario #2: Zero-Sum
Legend
African-American
Asian / Pac. Is.
Filipino
Latino
White
Other
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
-9%
-4%
-3%
0%
+5%
+7%
Average 70%
Average 70%
Progress Summary
Overall Success:
Achievement Gap:
(improved)
(not actual data)
Zero-Sum Scenario emerges from interventions that help the bottom but harm the top
Base Year
Outcome Year


Success by Cohort
Scenario #3a: Bottom-up
Legend
African-American
Asian / Pac. Is.
Filipino
Latino
White
Other
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
0%
0%
0%
+6%
+7%
+13%
Average 70%
Average 75%
Progress Summary
Overall Success:
Achievement Gap:
(improved)
Bottom-up Scenario emerges from interventions that help the bottom and hold the top harmless
An illustration (not actual data)
Base Year
Outcome Year


Success by Cohort
Scenario #3b: Win-Win
Legend
African-American
Asian / Pac. Is.
Filipino
Latino
White
Other
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
+6%
+5%
+7%
+21%
+16%
+24%
Average 70%
Average 82%
Progress Summary
Overall Success:
Achievement Gap:
(improved)
Win-Win Scenario emerges from interventions that help everyone but raise the bottom more than the top
An illustration (not actual data)
Base Year
Outcome Year

What does this tell us?

1. The Bottom-up and Win-Win scenarios are the only ones that get you higher completion **and** close the equity gap

2. How should we frame the challenge:

First completion then equity

We can work to raise the college completion rate and then try to make it more equitable

or

First equity and we get completion

We can pursue the equity outcome we want (Bottom-up or Win-Win) with the consequence being higher college completion rates

Are we properly aligning and integrating our strategies?

Some evidence that we may not be:

- Roughly 85% of colleges experiencing increases in overall completing rates did so at the cost of a widening of the achievement gap.
- Of the colleges that experienced some degree of reduction in their achievement gap, 82% of them did so by decreasing the top performing group.

Source: California Student Success Scorecard. Completion rate improvement was determined by looking at the three year performance of colleges (2003/04, 2004/05, & 2005/06 cohorts). The achievement gap was defined as the net change in the gap between the highest and lowest performing ethnicity groups for each college in the Scorecard (removing records containing small sample sizes for any of the ethnicity groups) over the same three year period.

Our dominant strategies often operate in separate orbits

Growing FTES

How do we increase our high school capture rates & student persistence?

Improving Completion

How do we get more students through the completion pipeline?

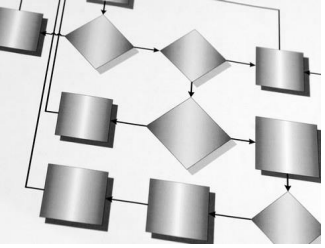
Closing the achievement gap

How do we improve or scale up our programs that support our under performing student groups?

Reframing the challenge can help bring about better alignment

What FTES and completion strategies support the equity outcomes we are pursuing?

(e.g. bottom-up or win-win)



Examples: story #2

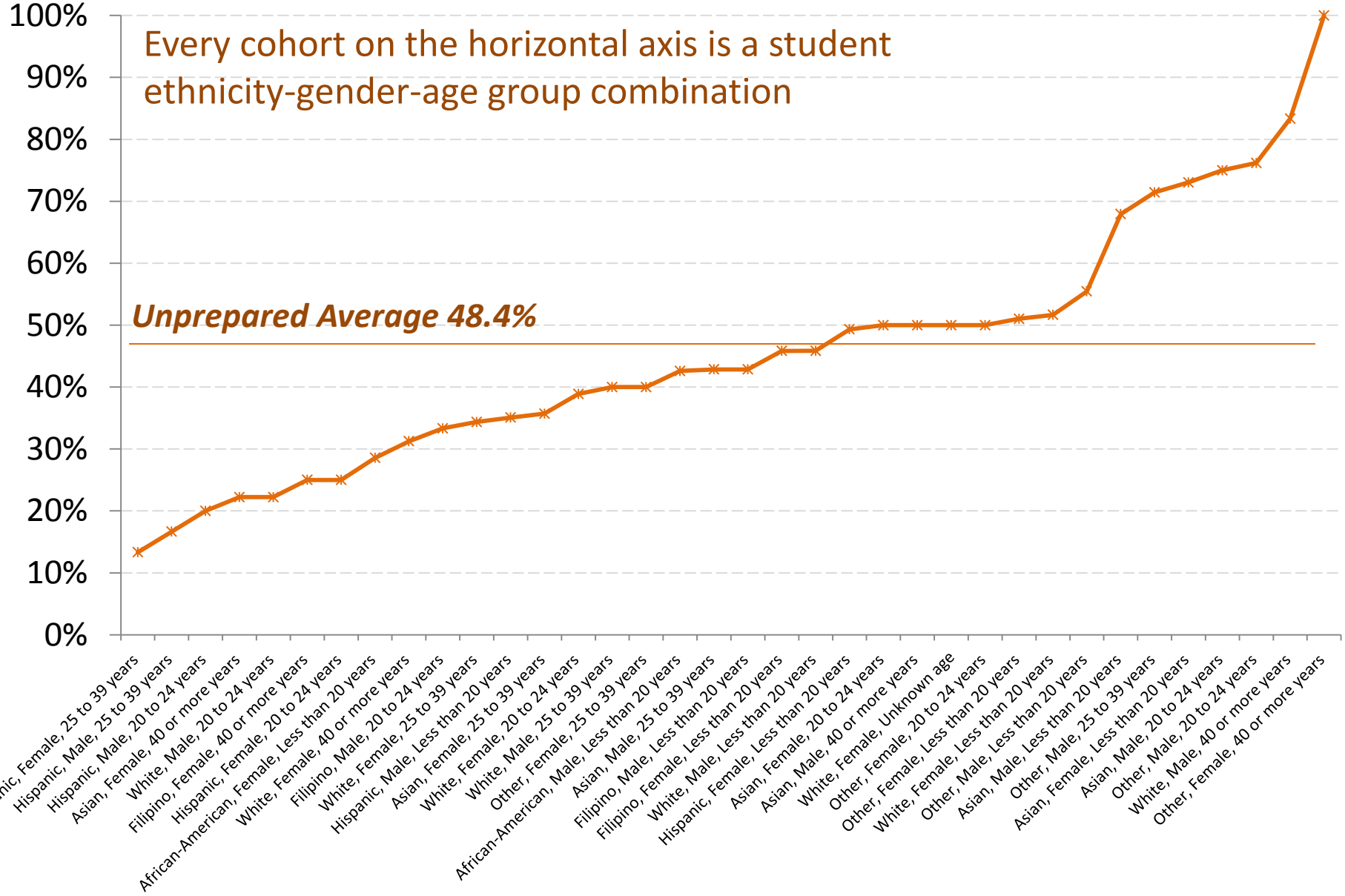
A strategy for closing the equity gap

An approach for closing the equity gap

- Date for a California Community College
- Breaking down the data
  - Prepared vs unprepared students
  - Student ethnicity, gender, age group

Distribution of DVC completion rates for **unprepared** student populations

(sorted from lowest to highest completion rates)



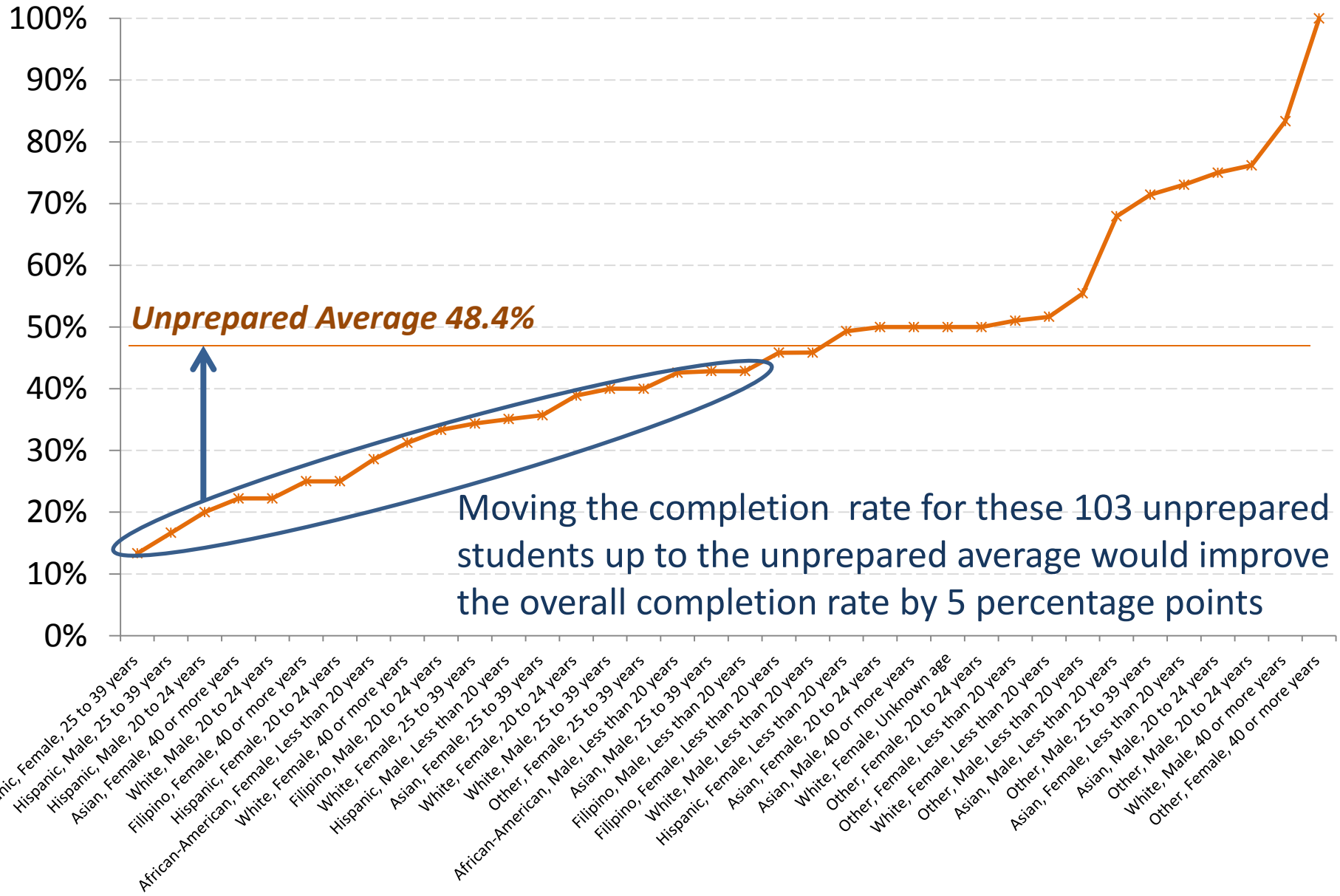
We can estimate the magnitude of change associated with various strategies

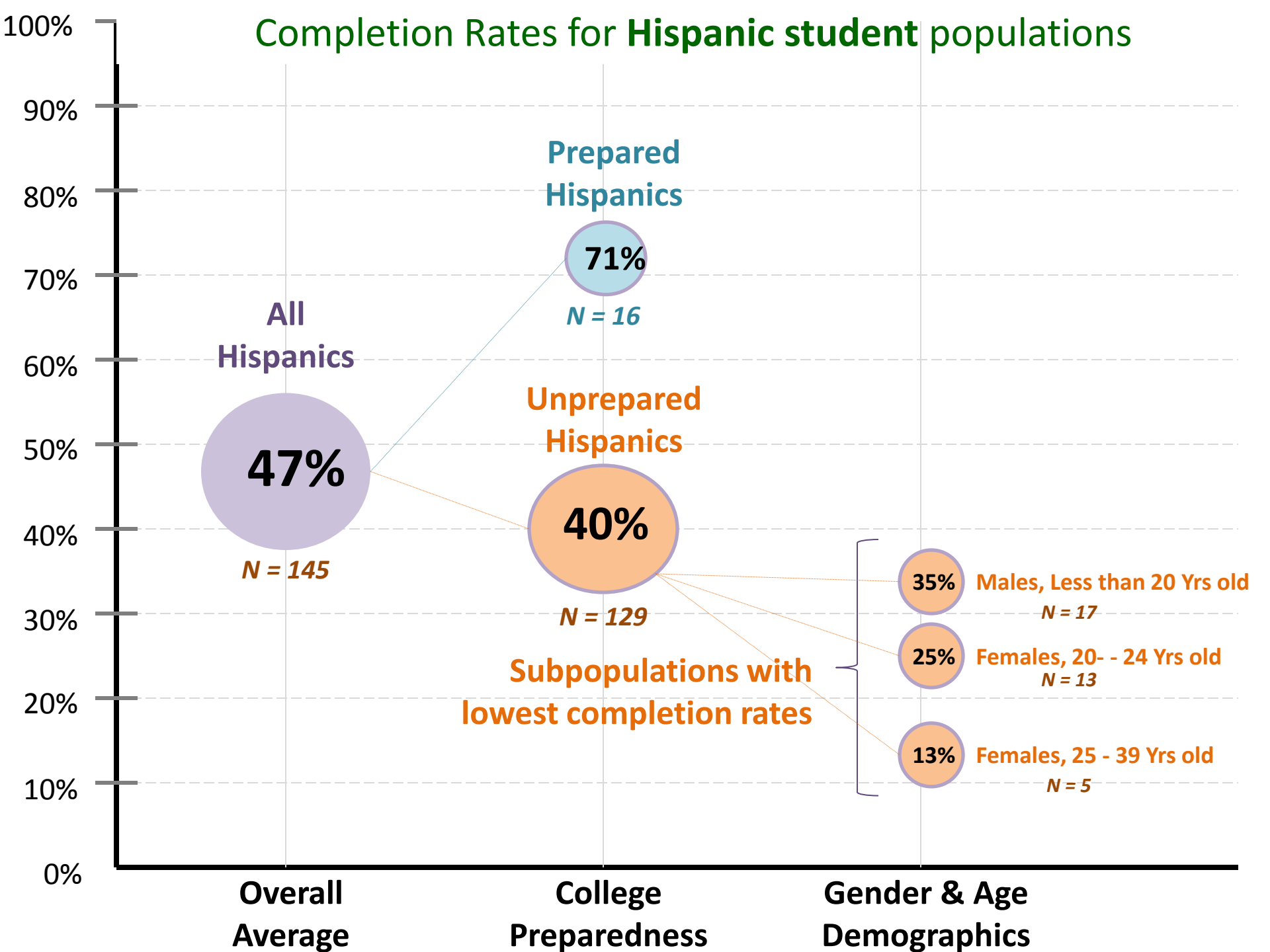
Subpopulation	Number in Unprepared Cohort	Completion Rate	# of additional completions needed to reach Unprep Average	Improvement in the Overall Average for change in previous column	Cumulative Improvement of moving each successive group
Hispanic, Female, 25 to 39 years old	15	13.3%	6	0.3%	0.3%
Hispanic, Male, 25 to 39 years old	6	16.7%	2	0.1%	0.4%
Hispanic, Male, 20 to 24 years old	5	20.0%	2	0.1%	0.4%
Asian, Female, 40 or more years old	9	22.2%	3	0.1%	0.6%
White, Male, 20 to 24 years old	27	22.2%	8	0.4%	0.9%
Hispanic, Female, 20 to 24 years old	12	25.0%	3	0.1%	1.1%
African-American, Female, Less than 20 years old	56	28.6%	12	0.6%	1.7%
White, Female, 40 or more years old	16	31.3%	3	0.2%	1.8%
White, Female, 25 to 39 years old	32	34.4%	5	0.3%	2.1%
Hispanic, Male, Less than 20 years old	134	35.1%	21	1.0%	3.1%
Asian, Female, 25 to 39 years old	14	35.7%	2	0.1%	3.2%
White, Female, 20 to 24 years old	18	38.9%	2	0.1%	3.3%
White, Male, 25 to 39 years old	15	40.0%	2	0.1%	3.4%
Other, Female, 25 to 39 years old	10	40.0%	1	0.1%	3.4%
African-American, Male, Less than 20 years old	54	42.6%	4	0.2%	3.7%
Filipino, Male, Less than 20 years old	56	42.9%	4	0.2%	3.9%
Filipino, Female, Less than 20 years old	48	45.8%	2	0.1%	4.0%
White, Male, Less than 20 years old	386	45.9%	19	0.9%	4.9%
Hispanic, Female, Less than 20 years old	146	47.3%	2	0.1%	5.0%
			= 103 students		**+ 5% increase in completion rate**

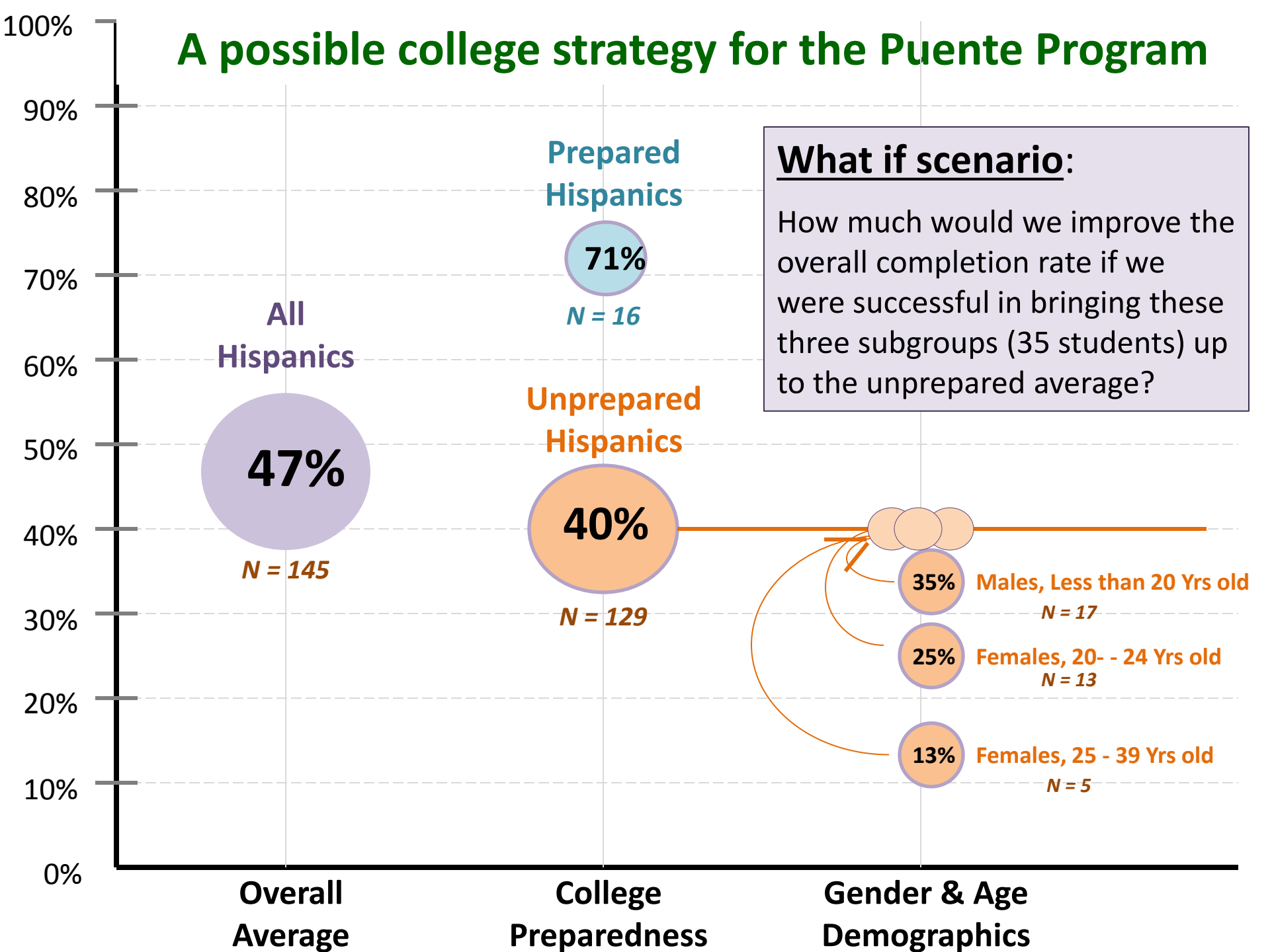
* Note that these figures apply to the 2007/08 cohort (most recent that is available) and therefore the figures associated with additional completions needed to reach the unprepared average apply to that cohort and not future cohorts.

Distribution of completion rates for **unprepared** student populations

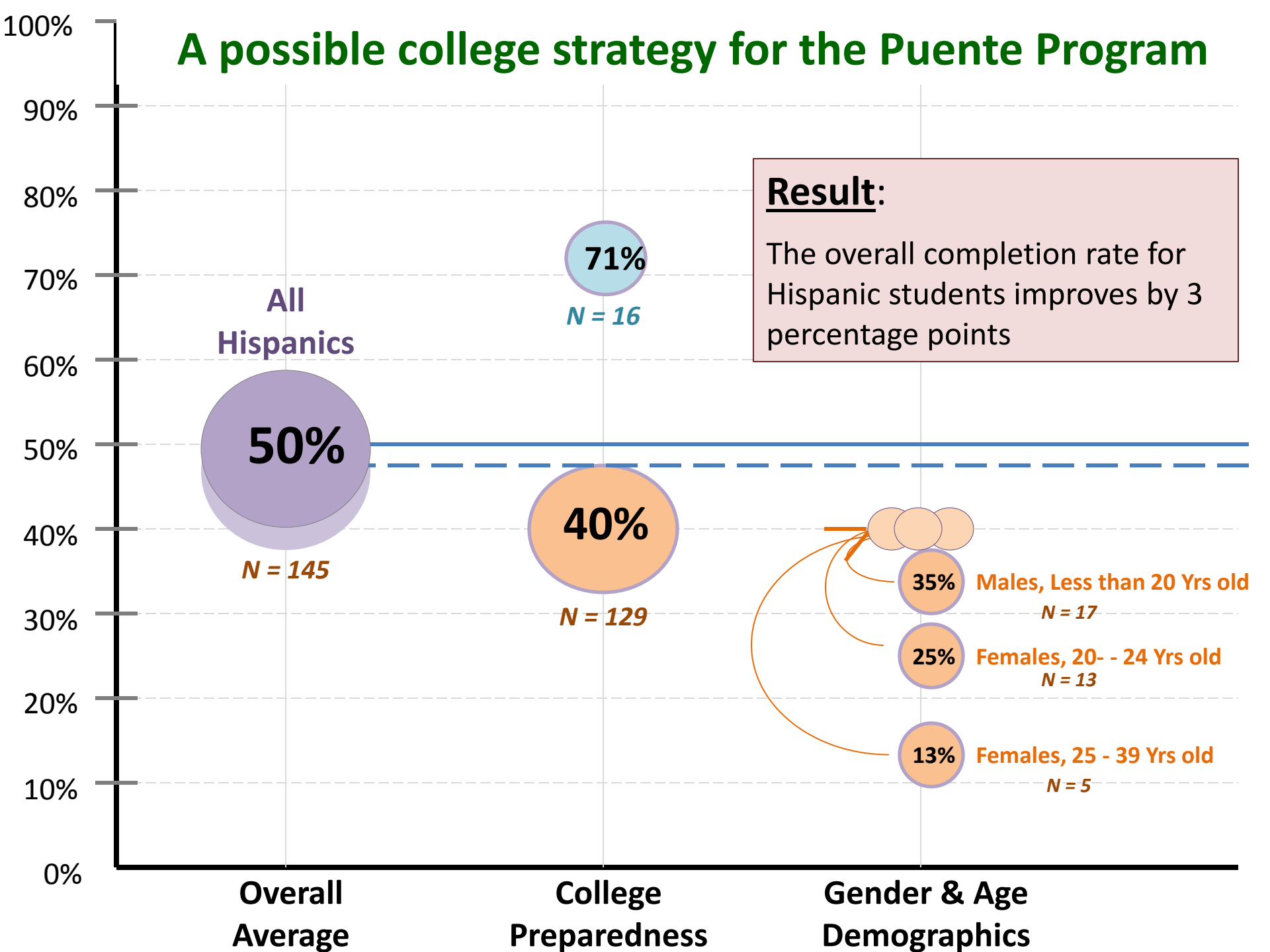
(sorted from lowest to highest completion rates)




Completion Rates for Hispanic student populations
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
All Hispanics
47%
N = 145
Prepared Hispanics
71%
N = 16
Unprepared Hispanics
40%
N = 129
Subpopulations with lowest completion rates
35%
Males, Less than 20 Yrs old
N = 17
25%
Females, 20- - 24 Yrs old
N = 13
13%
Females, 25 - 39 Yrs old
N = 5
Overall Average
College Preparedness
Gender & Age Demographics


A possible college strategy for the Puente Program
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
All Hispanics
47%
N = 145
Prepared Hispanics
71%
N = 16
Unprepared Hispanics
40%
N = 129
What if scenario:
How much would we improve the overall completion rate if we were successful in bringing these three subgroups (35 students) up to the unprepared average?
35%
Males, Less than 20 Yrs old
N = 17
25%
Females, 20- - 24 Yrs old
N = 13
13%
Females, 25 - 39 Yrs old
N = 5
Overall Average
College Preparedness
Gender & Age Demographics

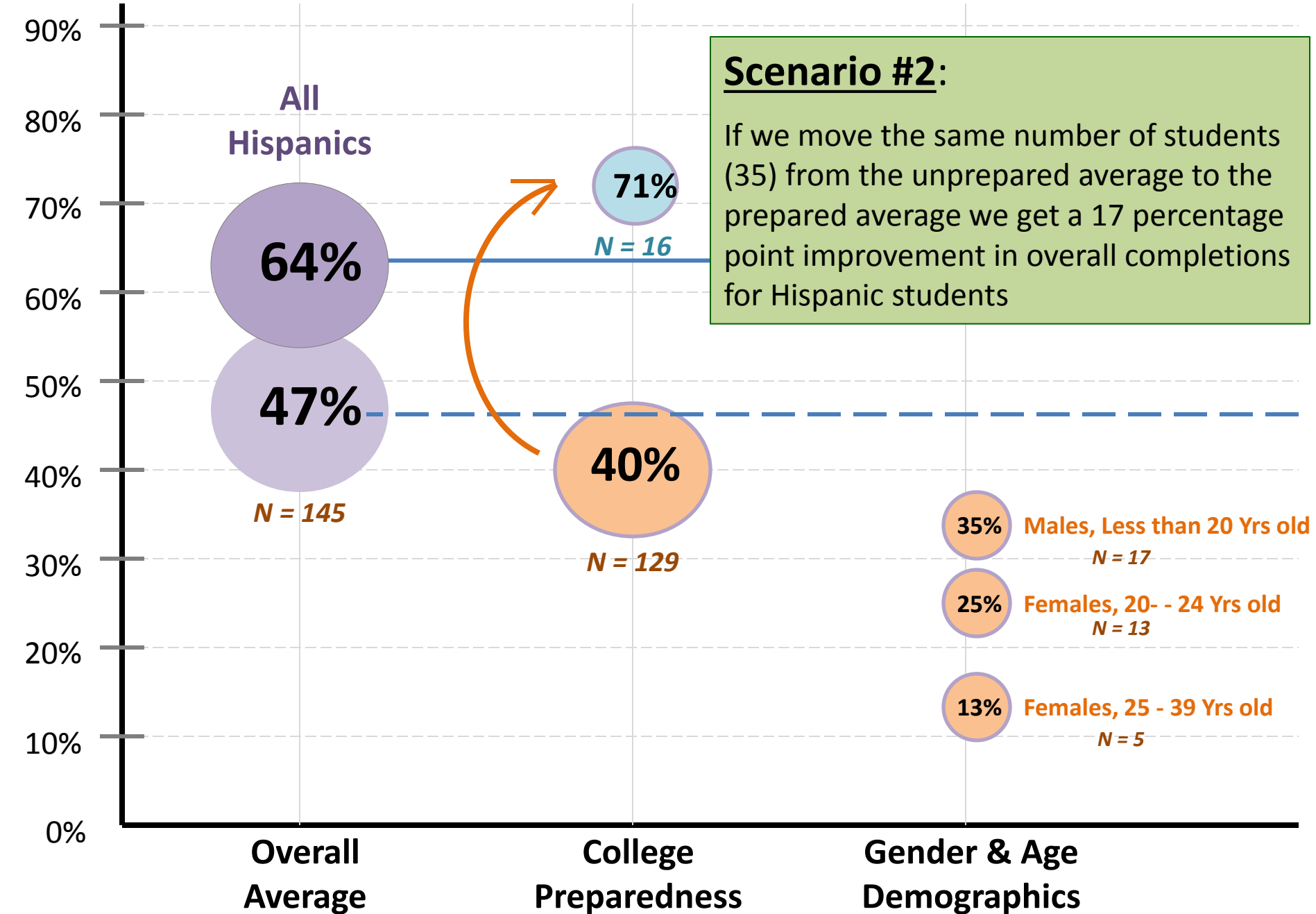
A possible college strategy for the Puente Program



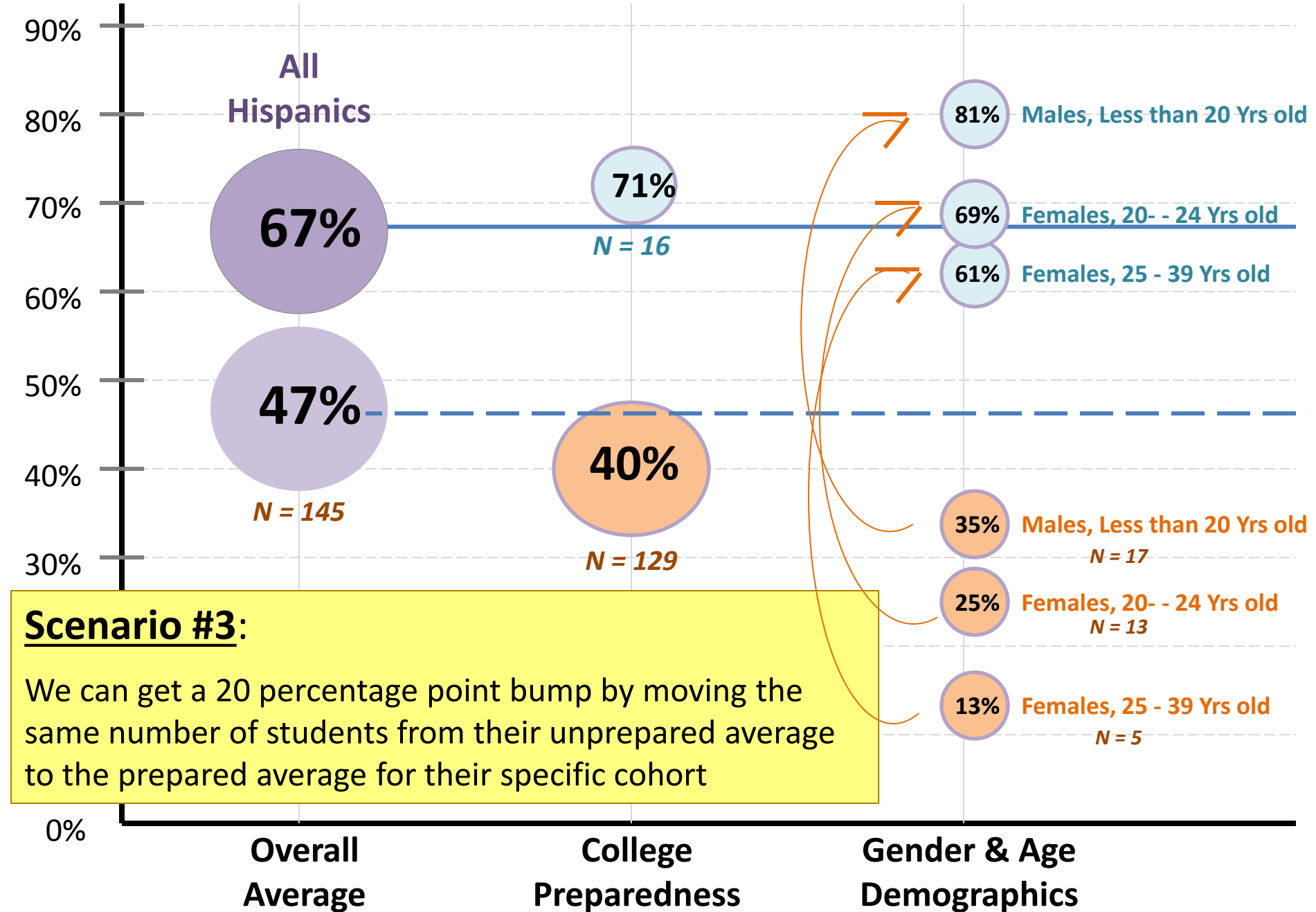
Result:

The overall completion rate for Hispanic students improves by 3 percentage points

A possible college strategy for the Placement Prep Program

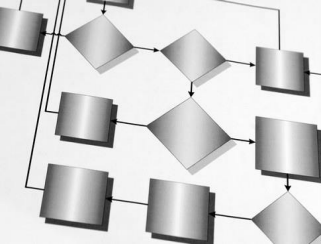


Another possible college strategy for the Puente Program



Scenario #3:

We can get a 20 percentage point bump by moving the same number of students from their unprepared average to the prepared average for their specific cohort



Examples: story #3

With all this data at our fingertips, why aren't we seeing more gains?

Let's call out the irony

Over the last two decades evidence on student performance has become increasingly available and yet the pace of change has remained slow.

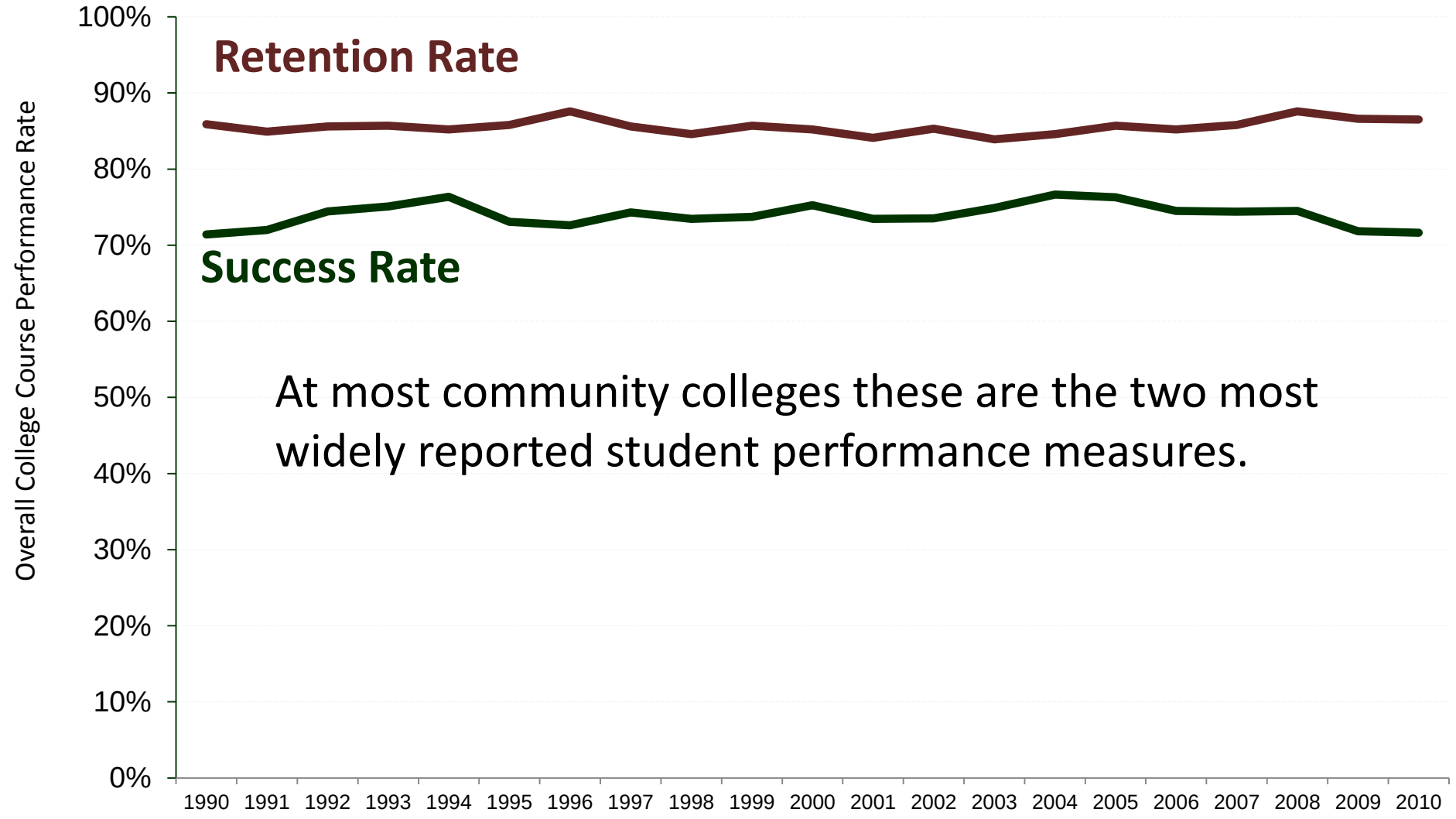
Why?

With all this data why are we still struggling?

1. Focusing on the wrong data

2. Using a one-size-fits-all framework

Are we looking at the right data?



At most community colleges these are the two most widely reported student performance measures.

Note: Success Rate is the ratio of enrollments with grade of A,B,C,CR,P divided by enrollments with a grade of A,B,C,D,F,CR,NC,W,I,P,NP,DR.

Retention Rate is the ratio of enrollments with grade of A,B,C,D,F,CR,NC,I*,P,NP divided by enrollments with a grade of A,B,C,D,F,CR,NC,W,I,P,NP,DR.*

Not a one-size fits-all world.

Prepared students

Full-time students

First-time students

Traditional students

At-risk students

Returning students

Degree-seeking students

Continuing students

Transfer students

English language learners

Career/tech students

Lifelong learners

Basic skills students

Dual enrolled high school students

Examples: story #4

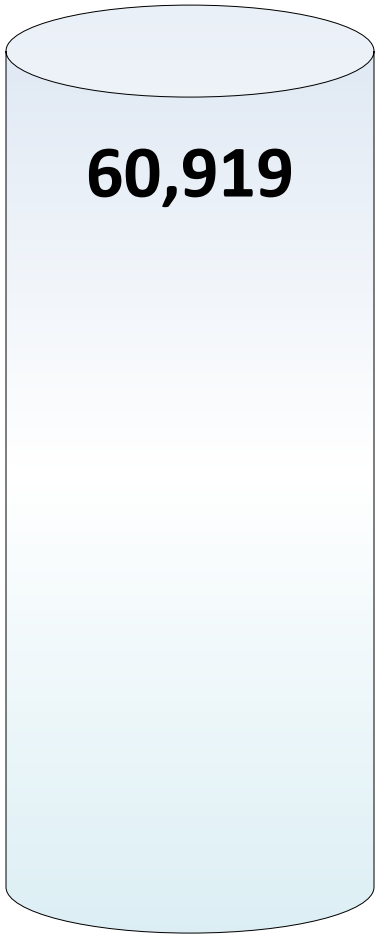
Board of Trustees Review of Student Success Data

November 12, 2014

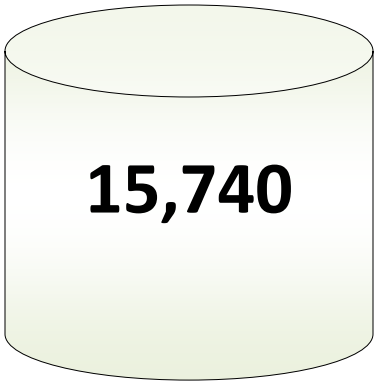
Gregory M Stoup
Sr. Dean Contra Costa Community College District

Completion Pathway	College District	State Average
Completion	52.6%	48.1%
30 Units	67.8%	66.5%
Persistence	66.5%	70.5%
Basic Skills Remediation		
English	47.8%	43.6%
Math	33.7%	30.6%
ESL	17.5%	27.1%
CTE Completion		

So how many Contra Costa District students are we counting?



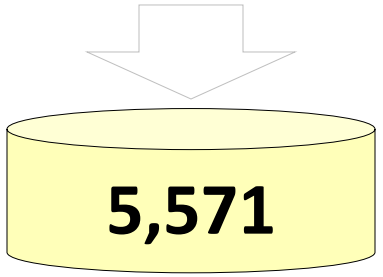
Total District Headcount



First-time Students

Number of first-time students with a minimum of 6 units earned who attempted any Math or English in the first three years

- **35%** of First-time students



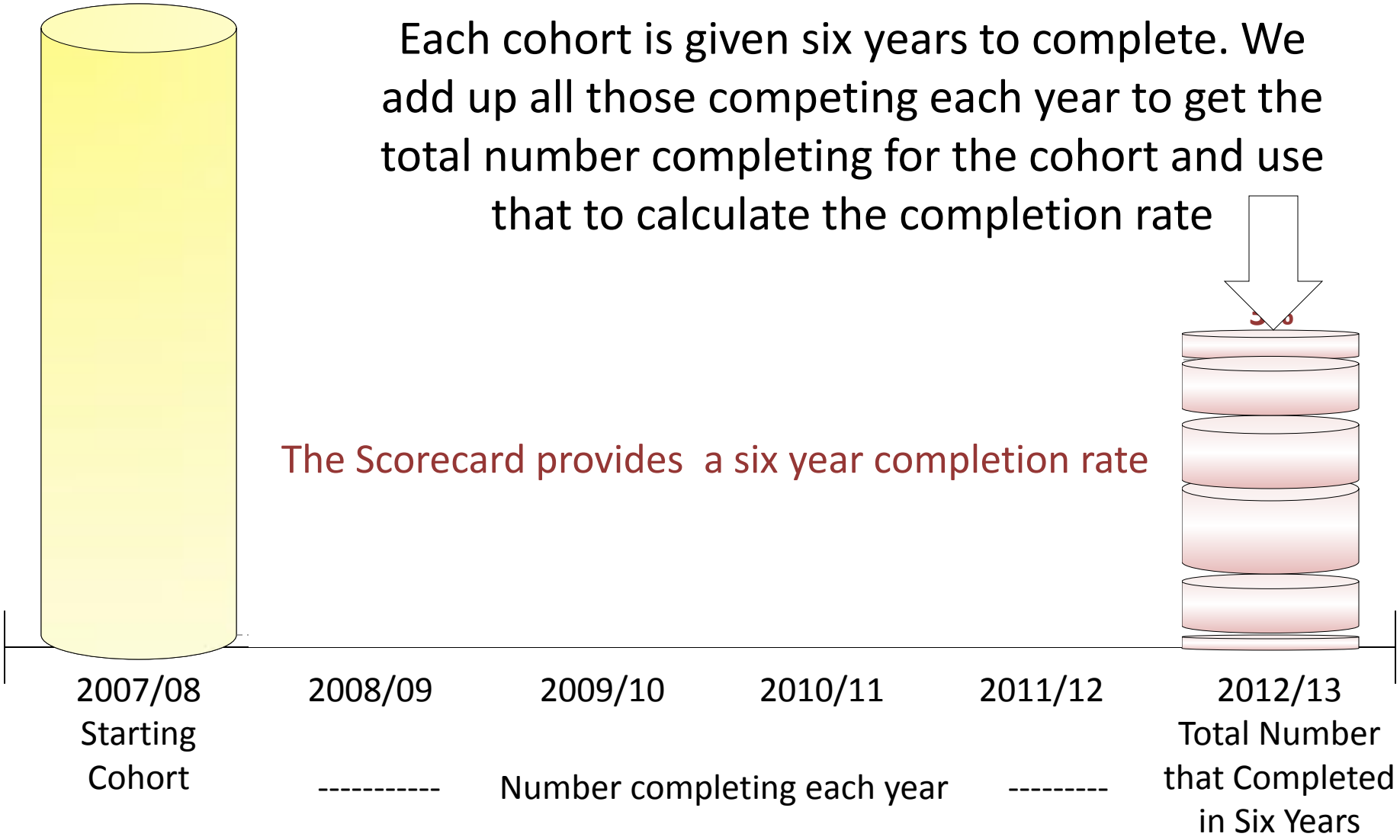
Students in the Scorecard Starting Cohort

Note: figures pertain to the 2007/08 academic year.

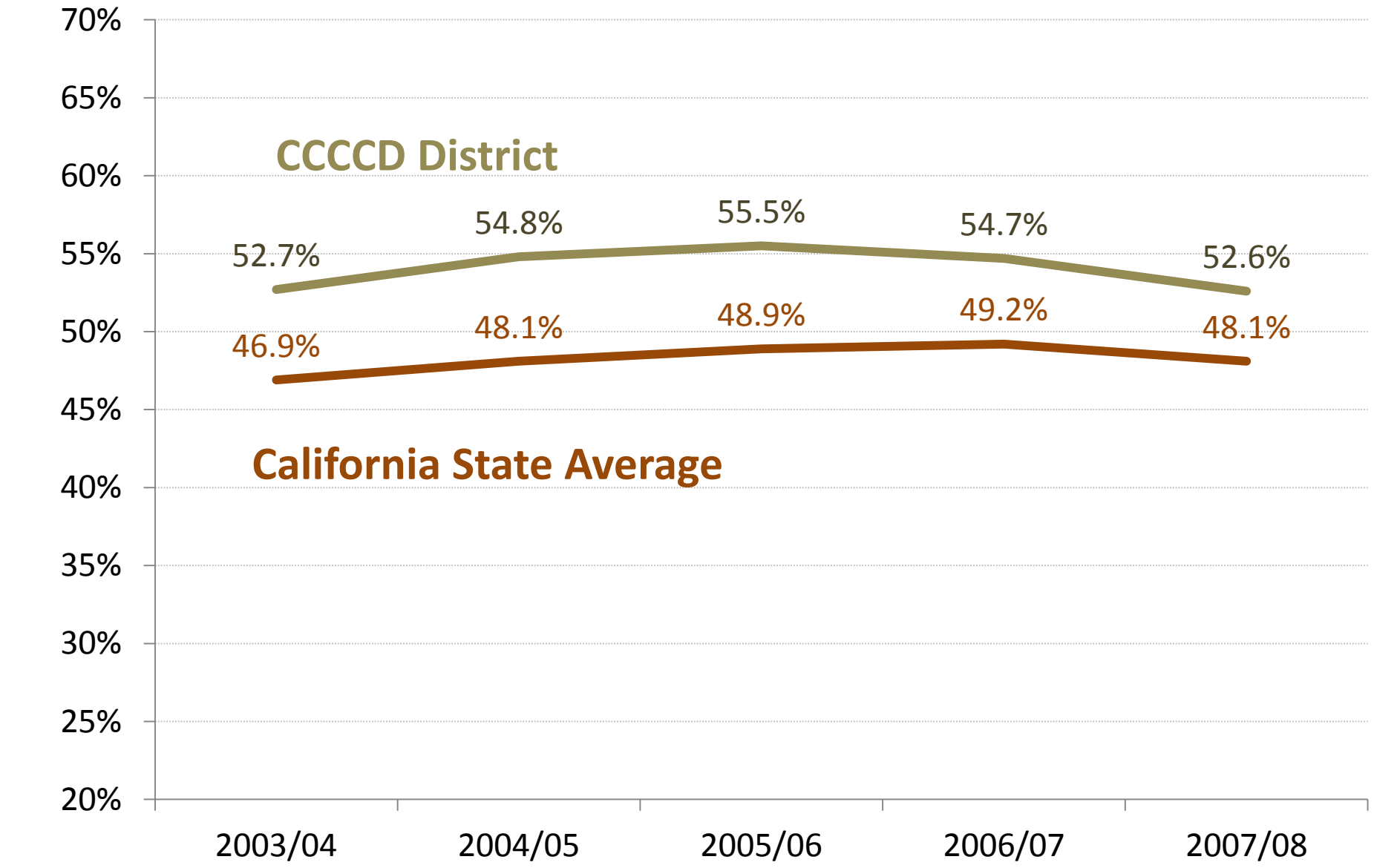
How long do we count?

Each cohort is given six years to complete. We add up all those competing each year to get the total number completing for the cohort and use that to calculate the completion rate

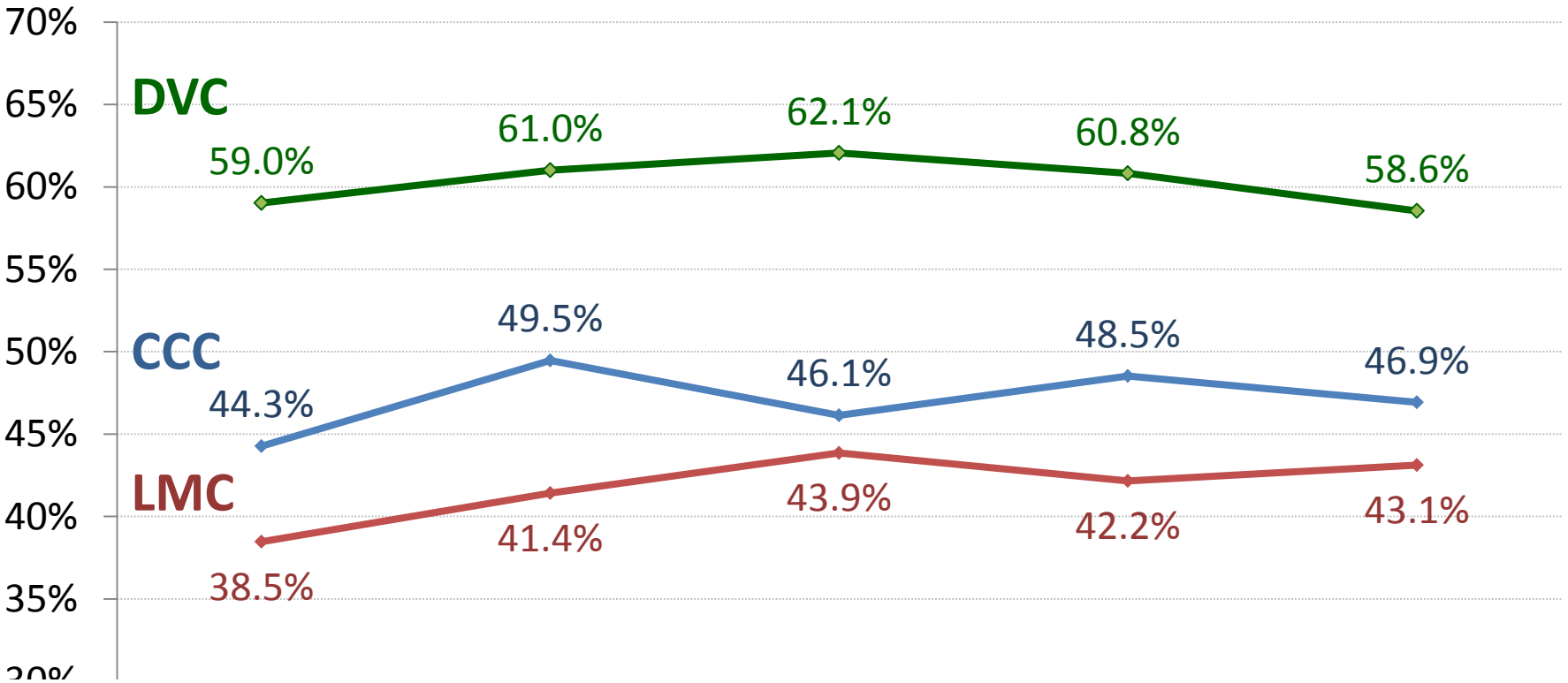
The Scorecard provides a six year completion rate



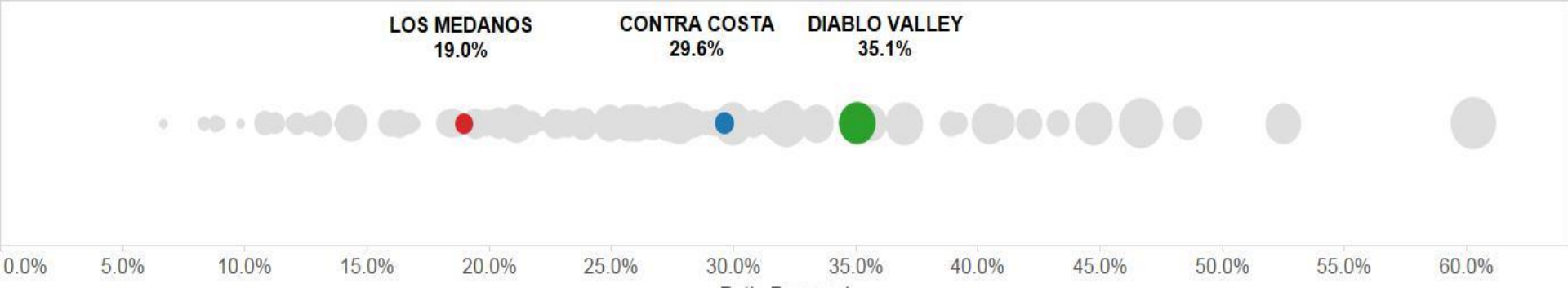
Five Year Trend in Overall Completion Rates



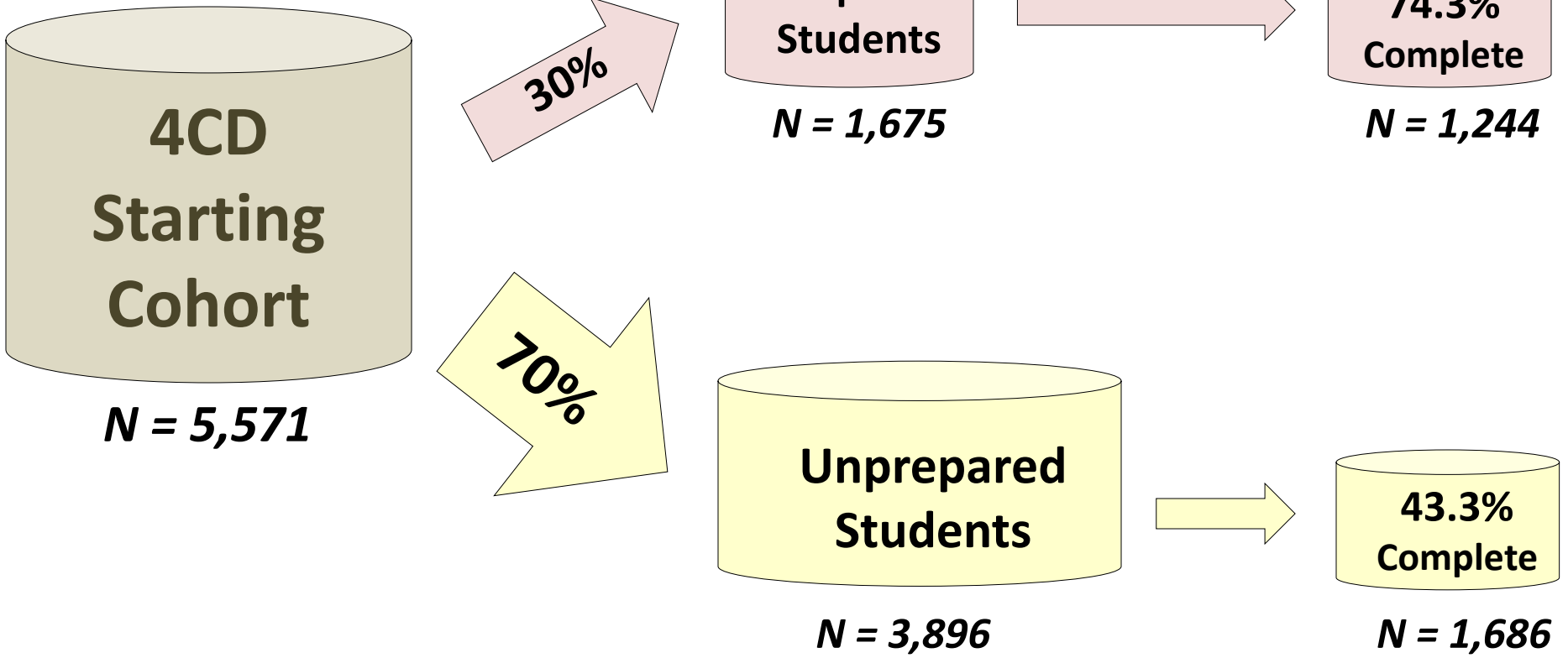
Five Year Trend in Overall Completion Rates



The colleges differ in the percentage of students that arrive college ready

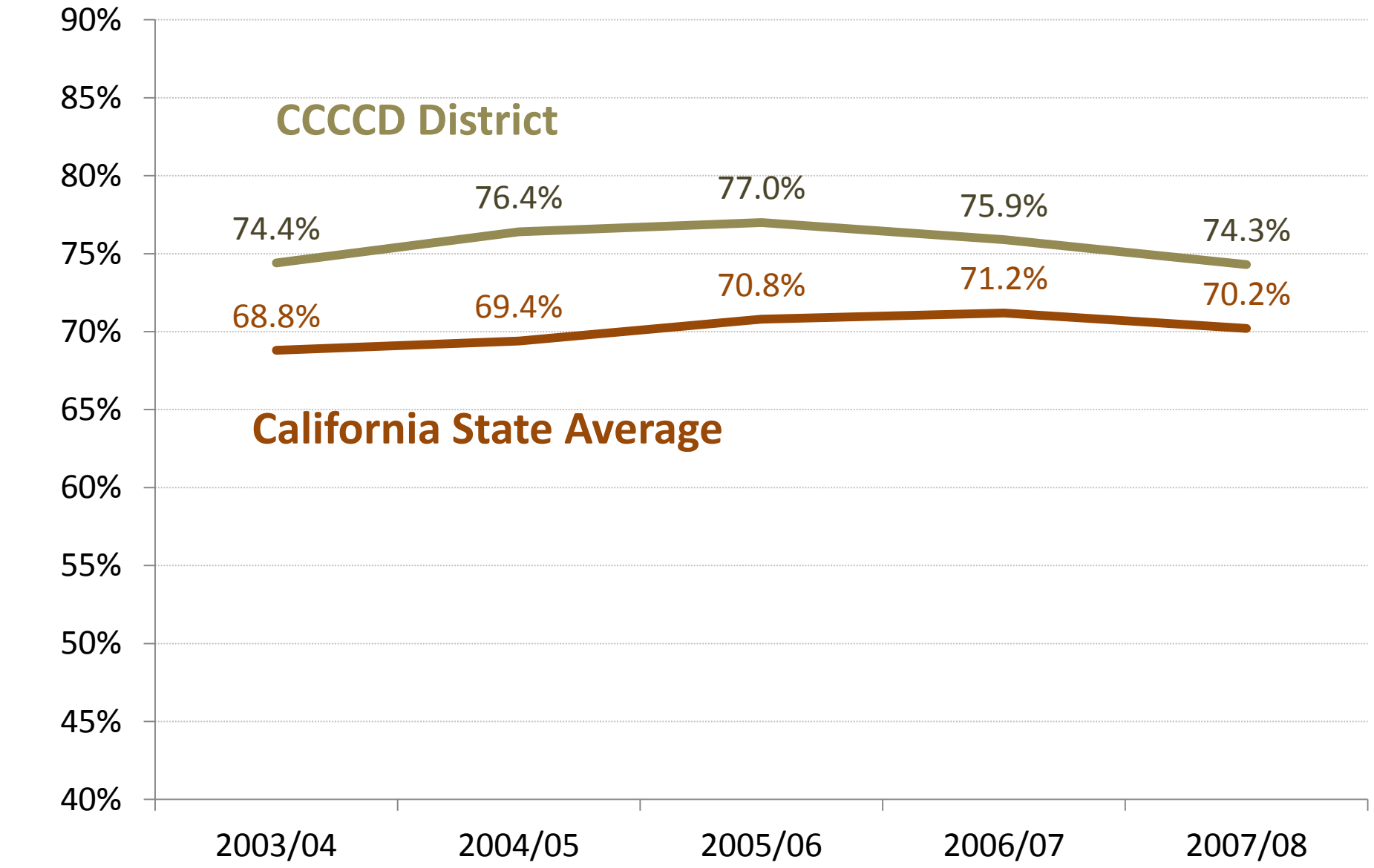


Prepared vs unprepared

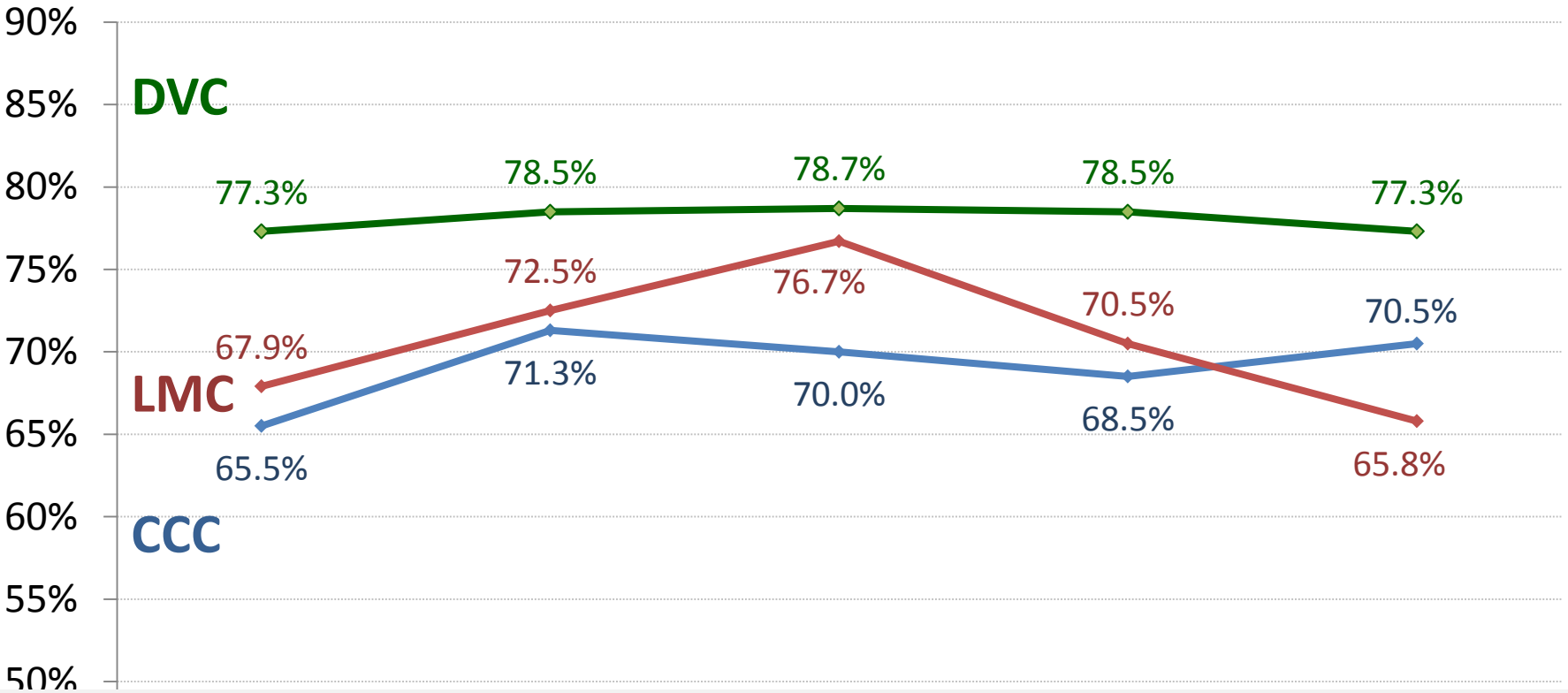


Note: the State Chancellor's Office defines unprepared as any completion oriented student whose first course in math or English was below transfer level.

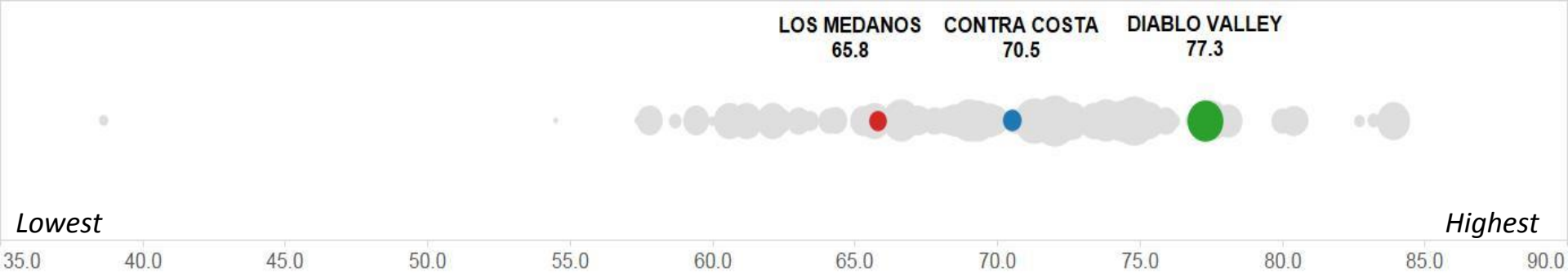
Completion Rates for Prepared Students



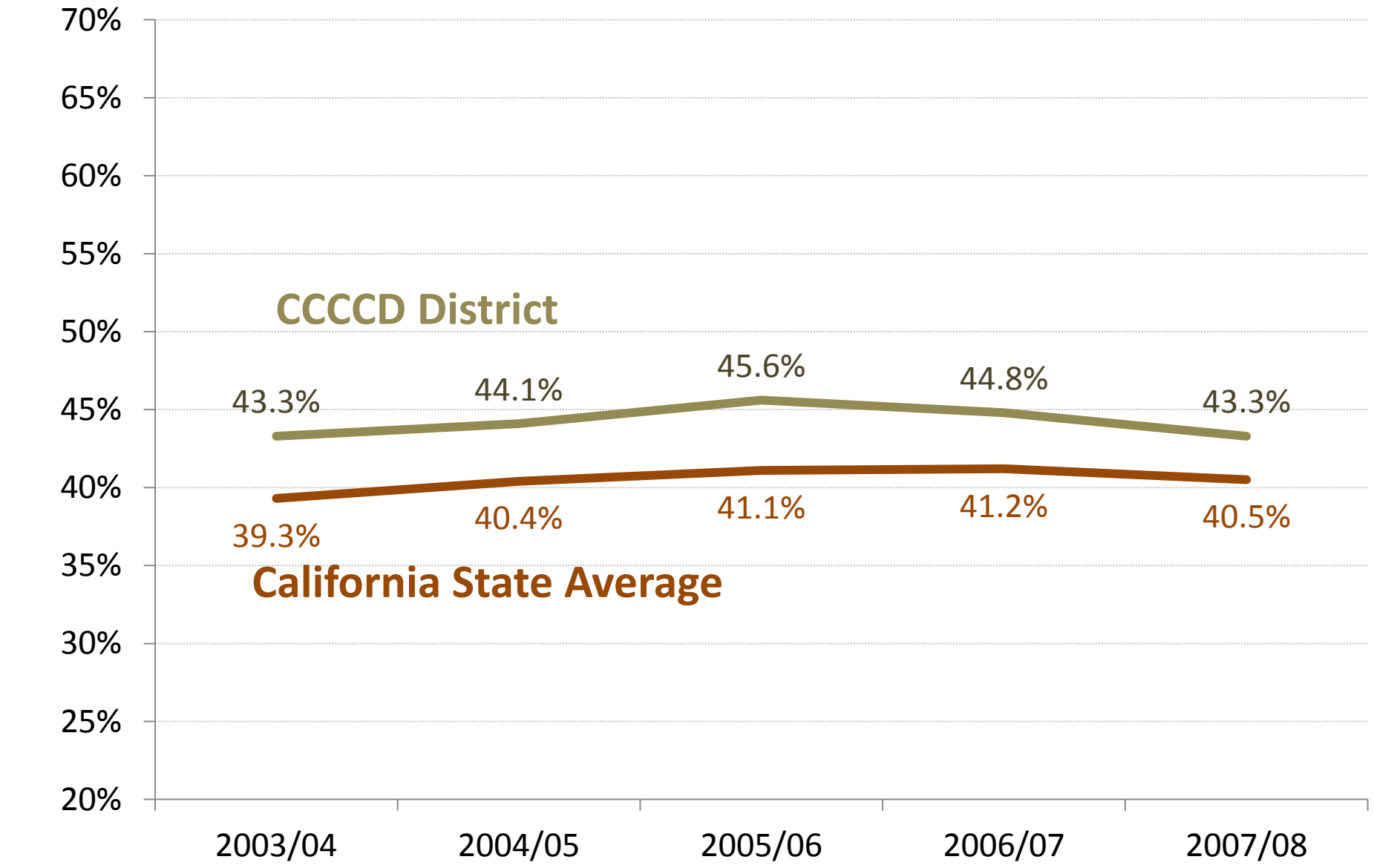
Completion Rates for Prepared Students



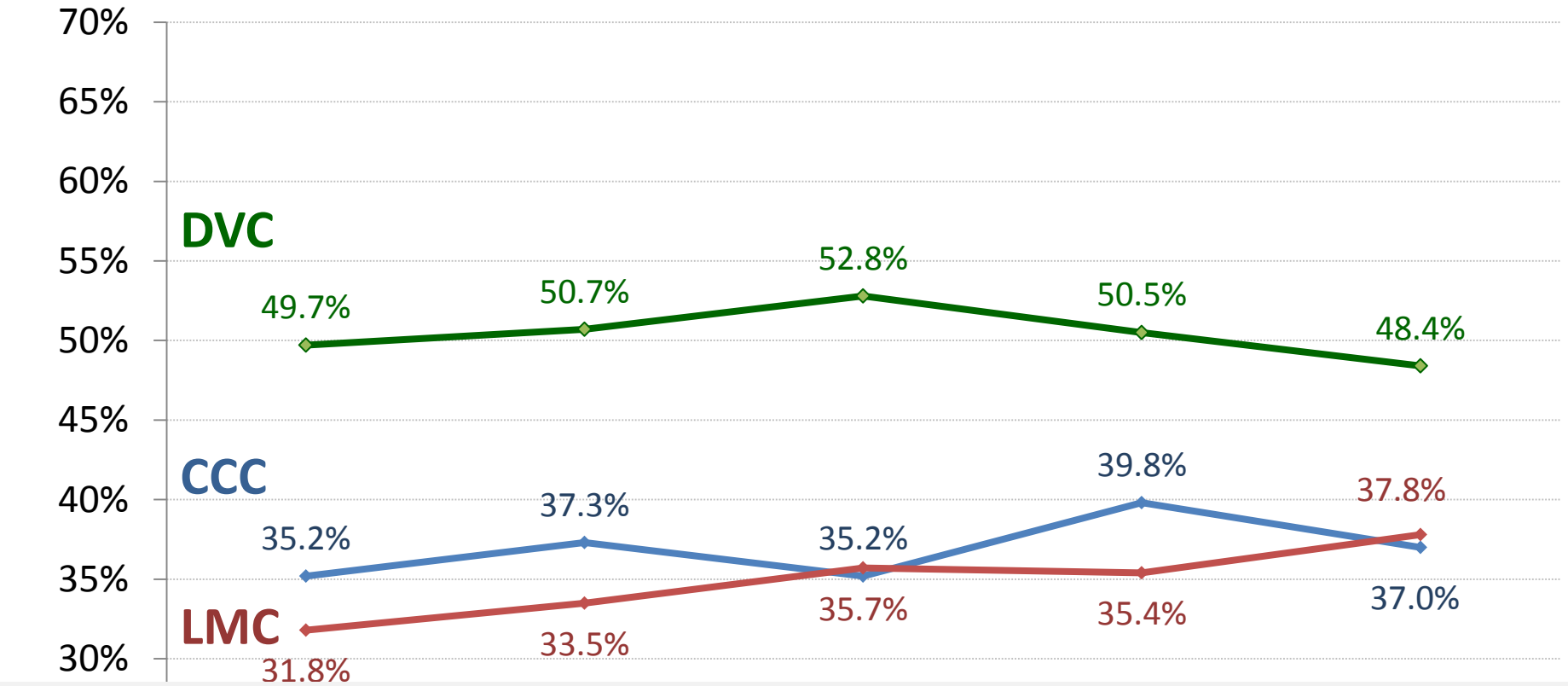
Prepared Completion Rates for all 112 California Community Colleges



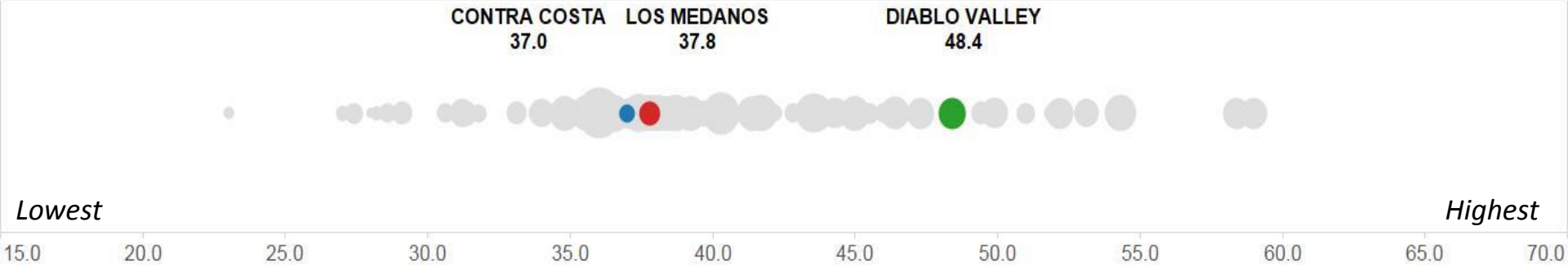
Completion Rates for Unprepared Students



Completion Rates for Unprepared Students



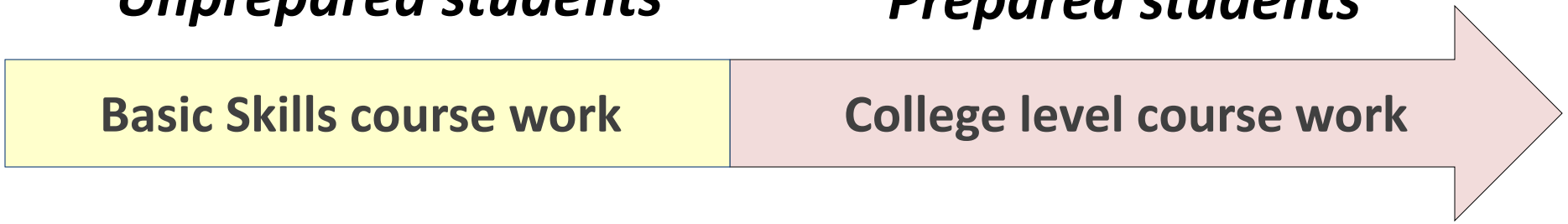
Unprepared Completion Rates for all 112 California Community Colleges



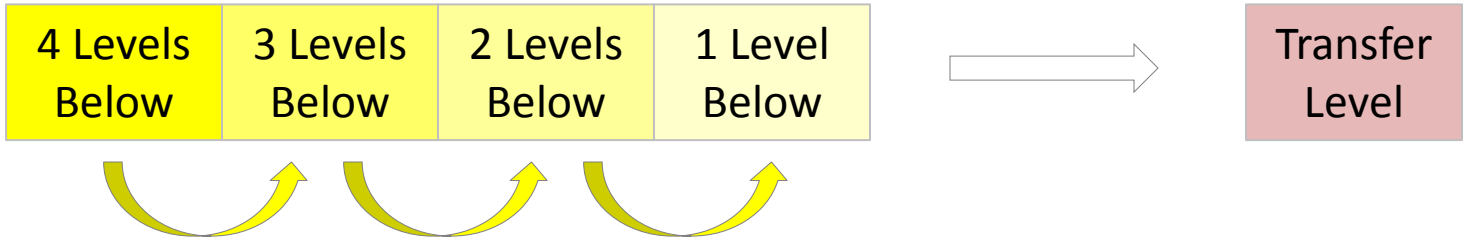
Defining the unprepared

Completion Pathway

Unprepared students ***Prepared students***



Basic Skills Sequence

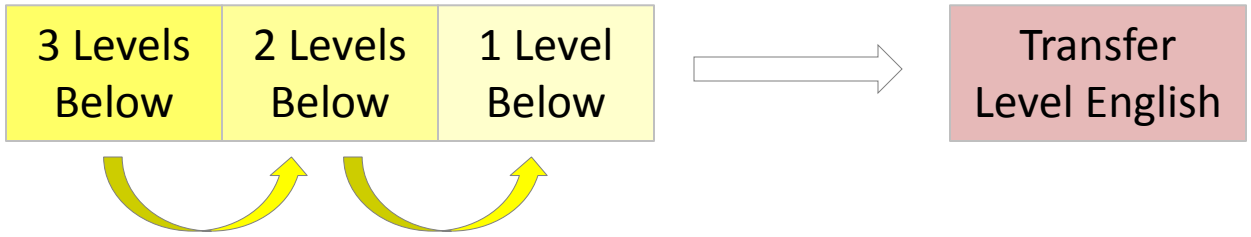


The percent of students attempting any course in the basic skills sequence

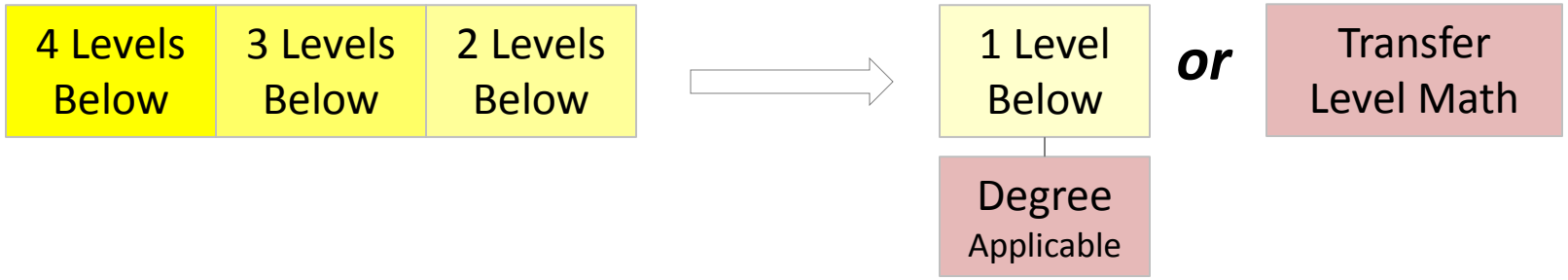
Who then pass the transfer (or degree applicable) course in the same discipline within 6 years

Scorecard: Basic Skills Remediation rate

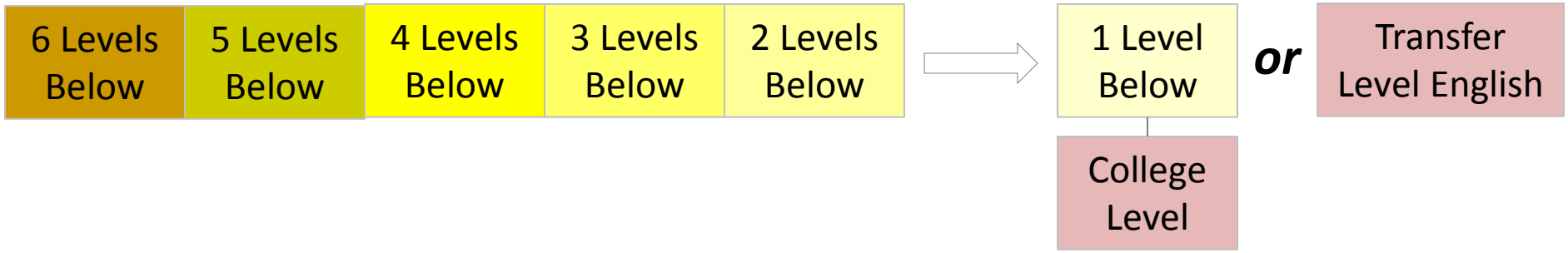
Basic Skills English Sequence



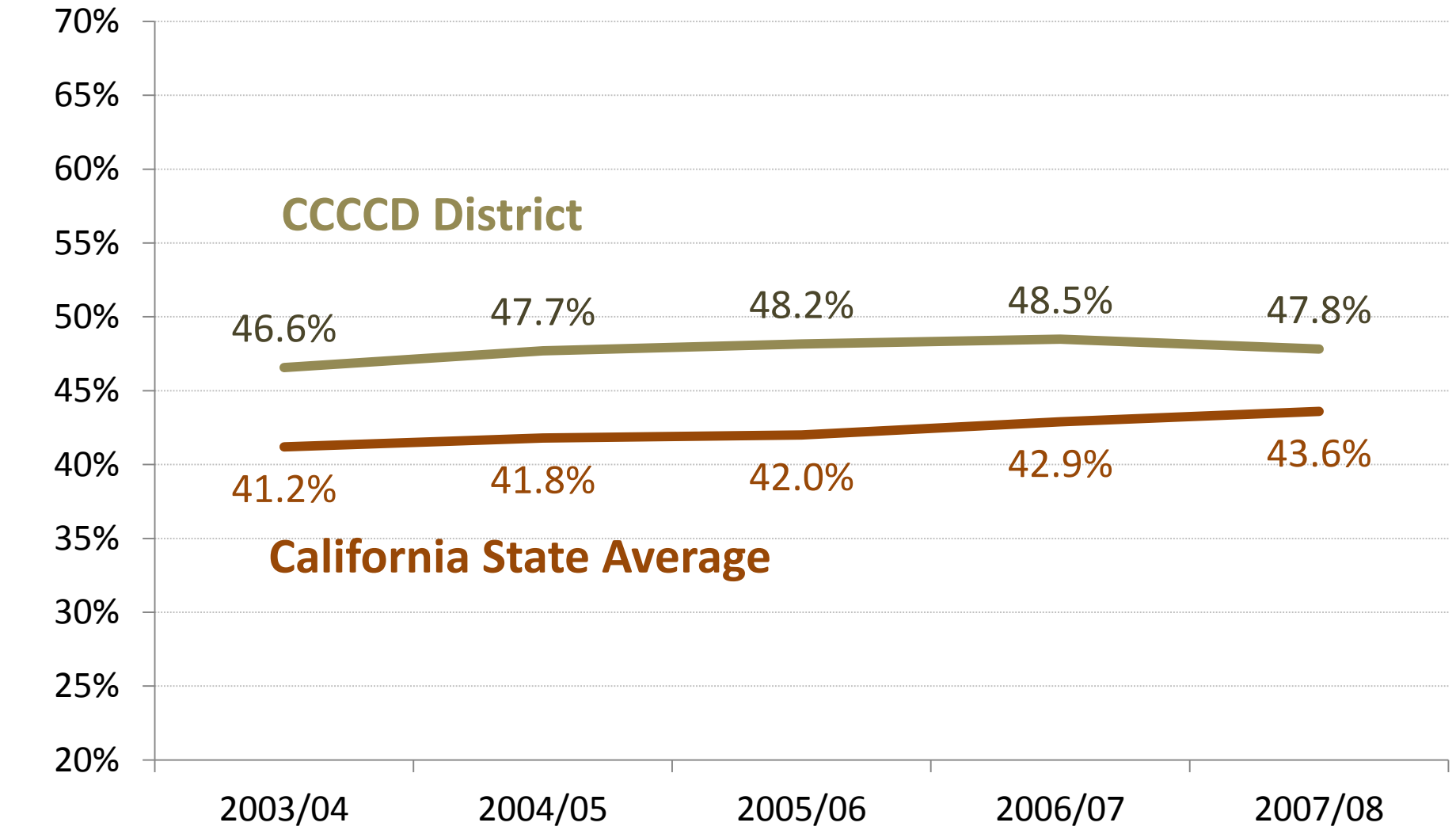
Math Sequence



ESL Sequence

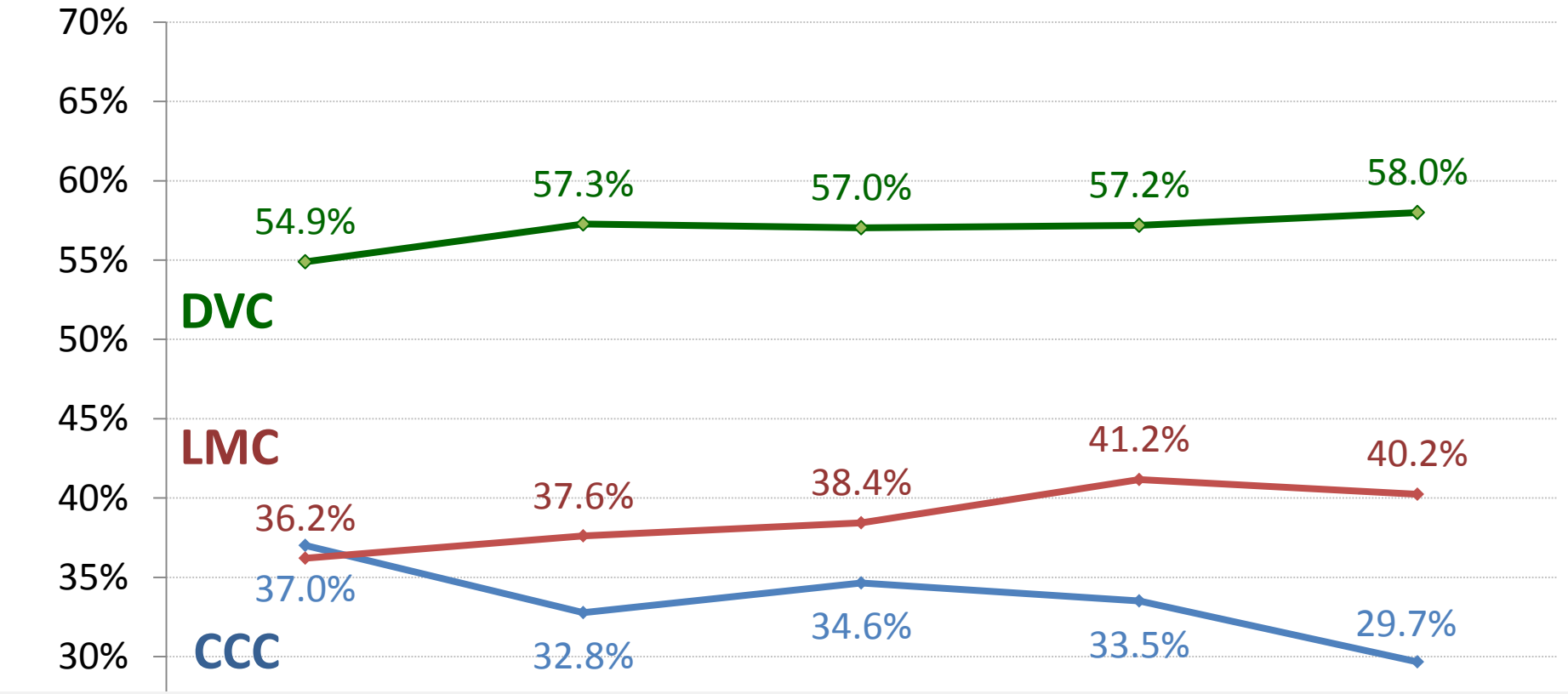


Five Year Trend in Remedial English Improvement Rates

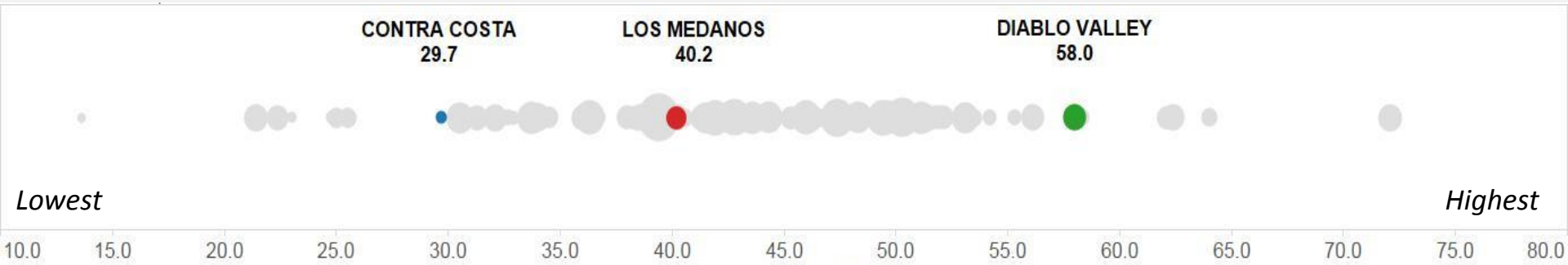


Definition: For five cohort years, the percentage of credit students who attempted a course designated at "levels below transfer" in English and successfully completed a college-level course in English within six years. The cohort is defined as the year the student attempts a course at "levels below transfer" in English at that college.

Five Year Trend in Remedial English Improvement Rates



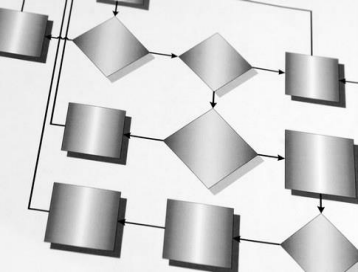
Remedial English Improvement Rates for all 112 California Community Colleges



Final thoughts

Yours, not mine ;)

Any comments, reactions?

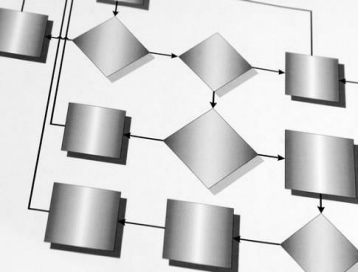


OACC Symposium

It has been a pleasure

November 14, 2014

Gregory M Stoup
gstoup@4cd.edu
Sr. Dean Contra Costa Community College District
Vice President, RP Group of California

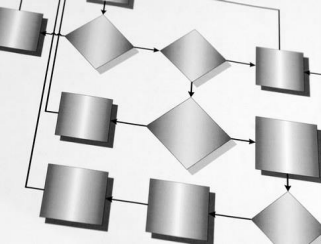


OACC Symposium

Storytelling with data part II: Advanced graphing Workshop

November 14, 2011

Gregory M. Stoup
Vice President, Research & Planning Group of California
Senior Dean, Contra Costa Community College District



Presentation overview

Part I

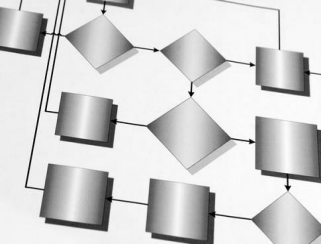
10:45 – 11:35

1. Why story telling?
2. Why visuals?
3. Story-based messaging through visuals
4. More than a few examples

Part II

12:40 – 1:30

5. Guidelines for building an effective visual
6. Designing visuals for greatest impact
7. Walking through the process



Presentation overview

1. Why story telling?
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5. **Guidelines for building an effective visual**
6. Designing visuals for greatest impact
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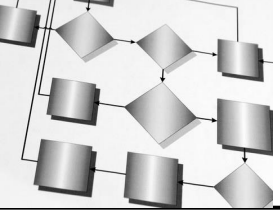


Reporting findings vs messaging

"We are moving past the traditional practice of reporting findings to thinking about how we craft effective messages & build compelling stories"

Jettison the bad advice from the past

"Tell them what you're going to tell them, tell them, and then tell them what you just told them."

"The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information"

- cognitive psychologist George A. Miller

A better approach: walk them through an engaging story

Keeping it simple

Message retention rates for presentations:

# of Take Aways	Retention Rate after 1 hour
1 message	90%
2 messages	65%
3 messages	20%

Old marketing adage:

"When you say 3 things you say nothing"

Source: Edward Tufte, Visual Explanation: Images and Quantities, Evidence and Narrative, Graphics Press; 4th printing with revisions edition, Graphics Press; 2 edition (1997).

Choose the right textual expression

Statements regarding equivalent quantities tend to be interpreted in different ways

Which do people feel is smaller?	33%	or	1 in 3
Which is viewed as greater?	Growing by 100%	or	Doubling current size
Which do more people remember?	25 percent	or	25%
Which is felt more negatively?	10% reductions	or	10% reductions

Source: Chip Heath & Dan Heath, Made to Stick: Why Some Ideas Survive and Others Die, Random House; 1 edition (2007).

Take advantage of thinking patterns

Research in cognitive psychology has revealed that much of our initial perception of a graph takes place in the first **0.5 seconds**.

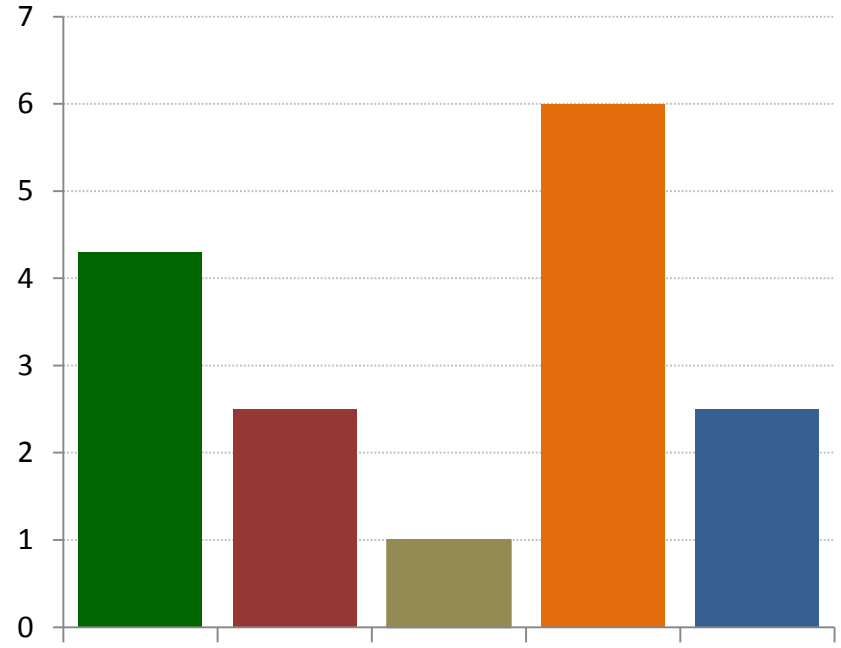
How do we choose a graph that reinforces rather than impedes these first impressions?

Some guidelines on graph selection……

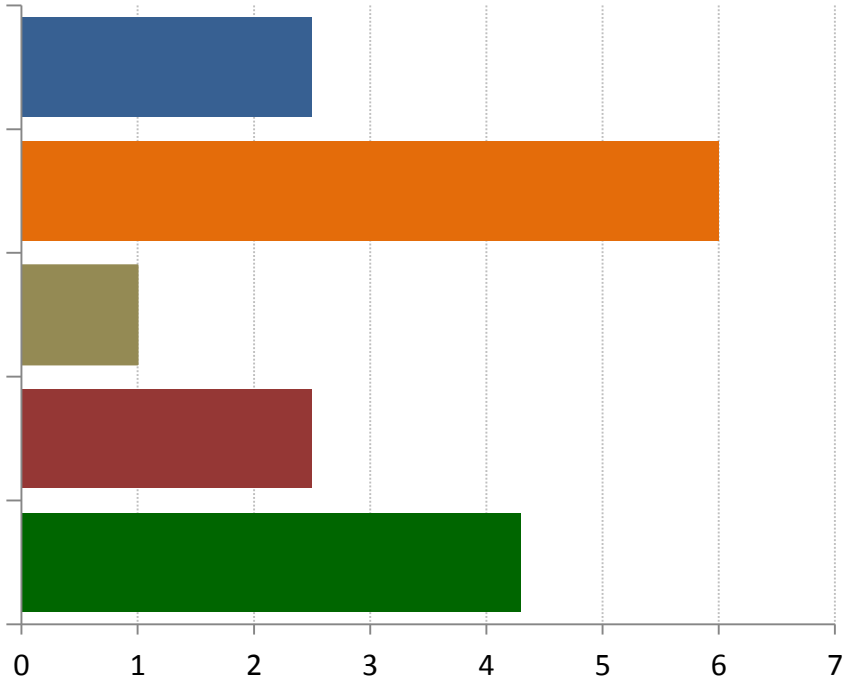
Source: Wells. G. L. & Rydell, S.M. & Seelau, E.P. (1999). The Selection of distracters for observers. Journal of Applied Psychology, 66, 688-694.

Cognitive tendencies and graph selection

Vertical Bar Graph



Horizontal Bar Graph



Orange is larger

Orange is growing faster

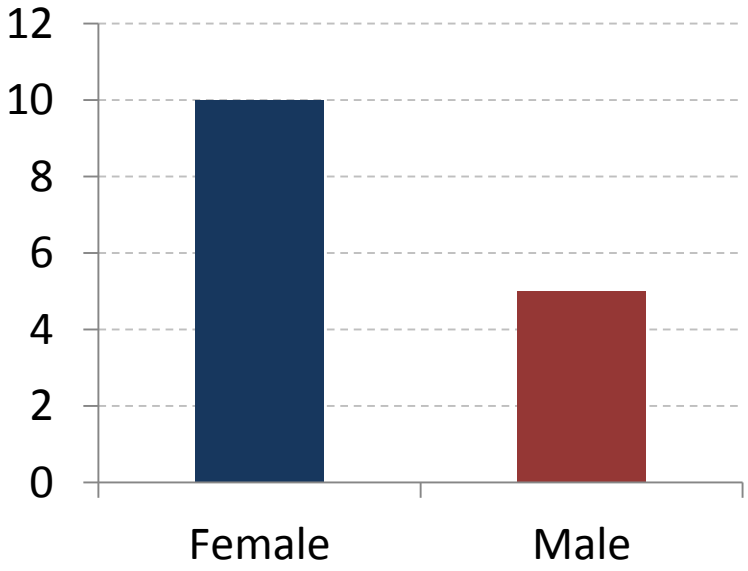
Initial Impressions

Static

Dynamic

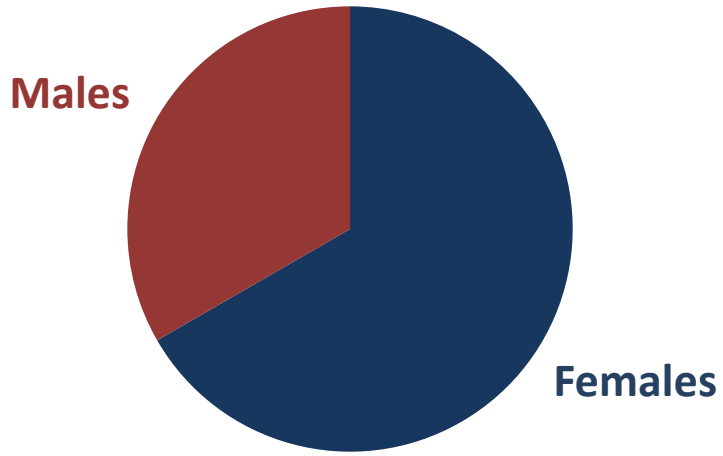
Cognitive tendencies and graph selection

Vertical Bar Graph



Two populations, more females than males

Pie Chart



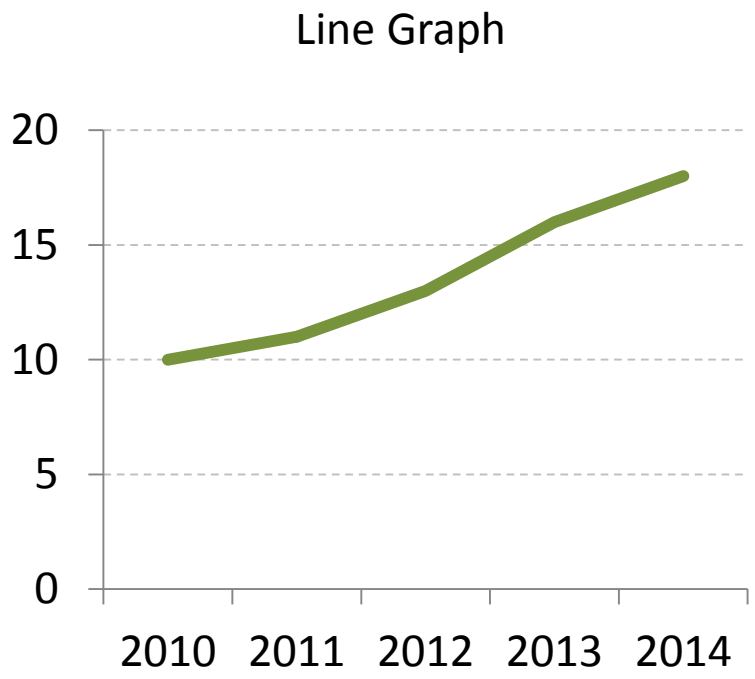
A single population composed of more females

Initial Impressions

Exclusive

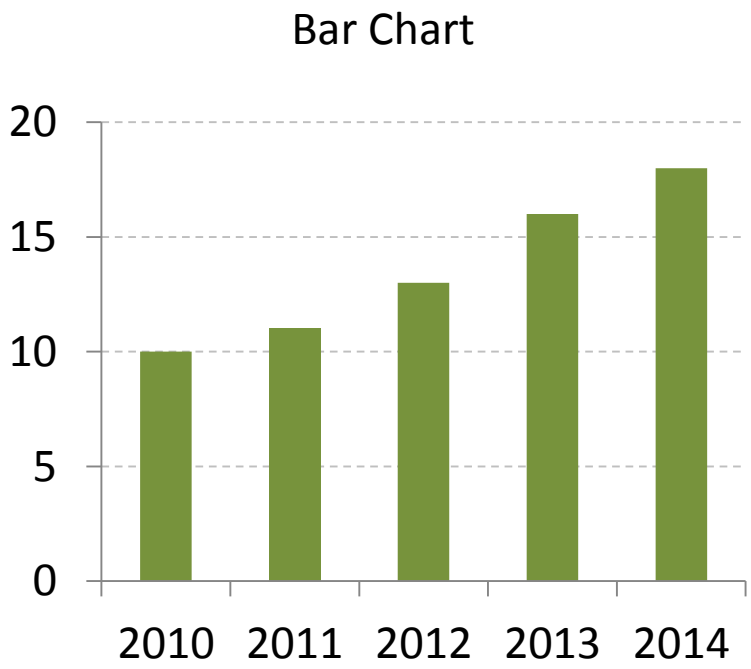
Inclusive

Cognitive tendencies and graph selection



Something is improving

Improving Success Rates

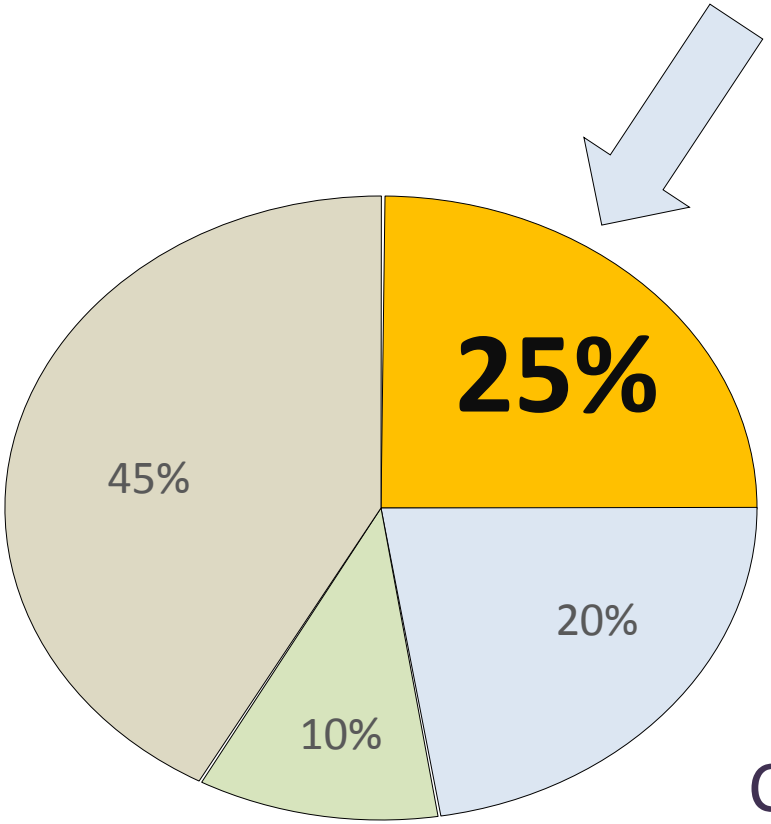


Something is getting bigger

Enrollment Growth

Some specifics

The first slice of your pie should correlate with your primary message



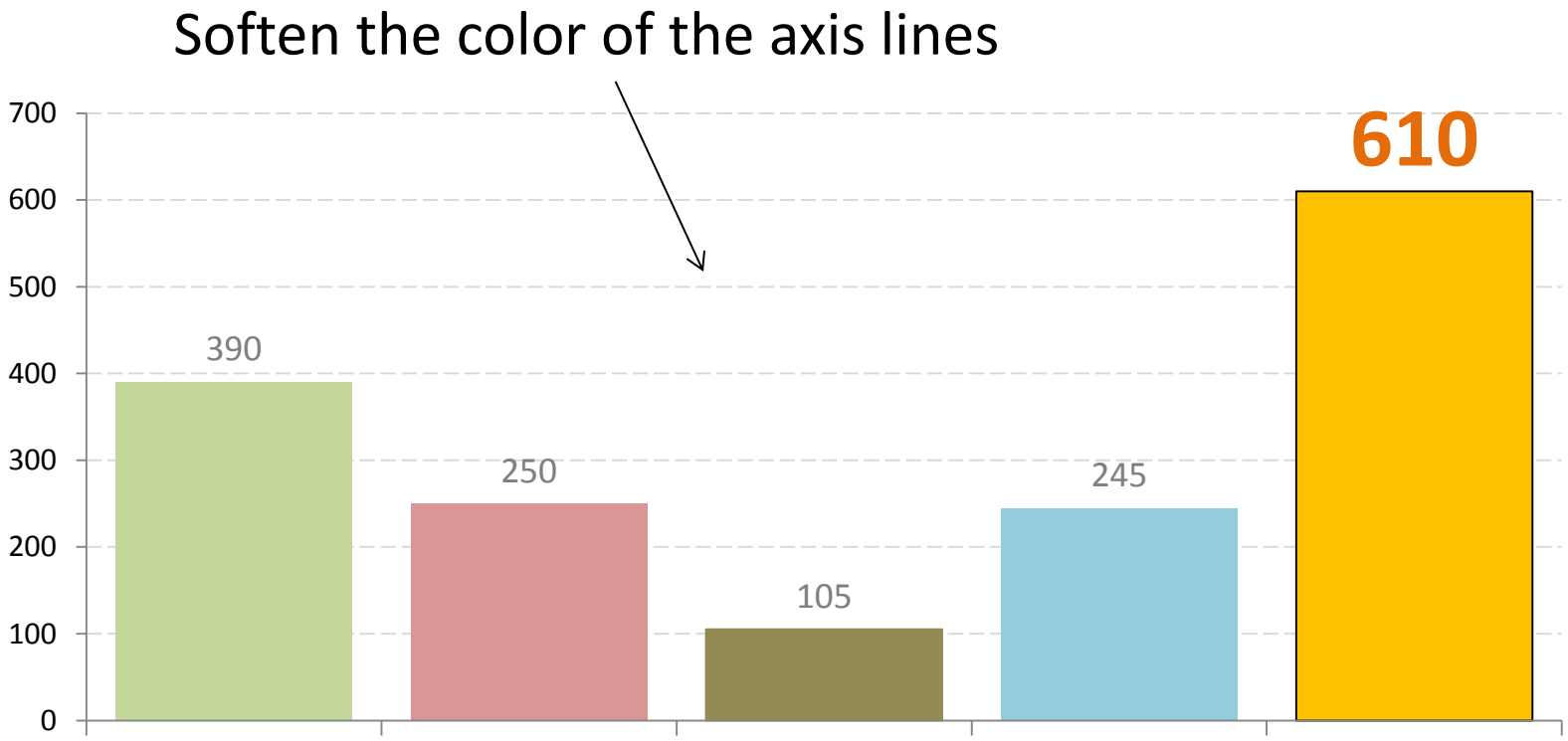
Give it a high color contrast ratio relative to the rest of pie

Make it brightly colored if it is correlated with a positive or uplifting message; a duller color if negative or a challenge

Contrast any associated text (font size and bold lettering)

Some details & specifics

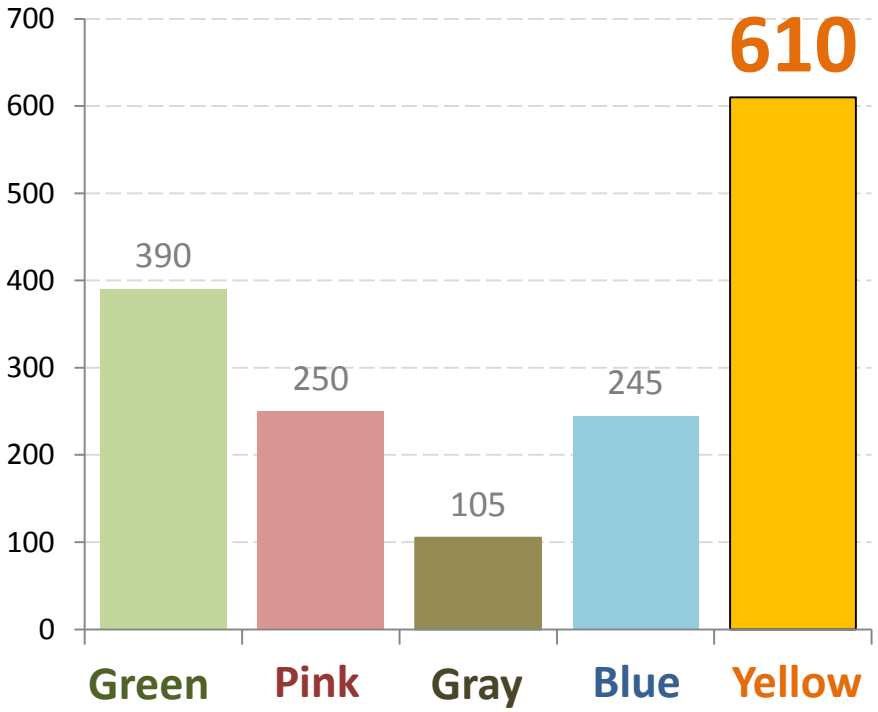
If its' a bar chart, have the last bar highlight your primary message

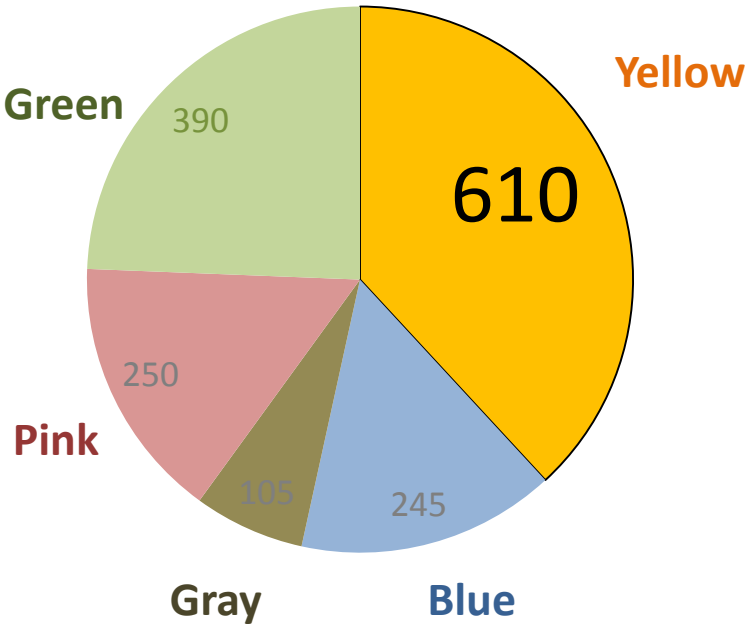


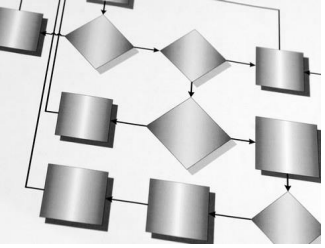
More details

To reduce eye movement, don't use a chart legend unless the chart labels create a muddled composition

And have the text color match the bar / pie slice







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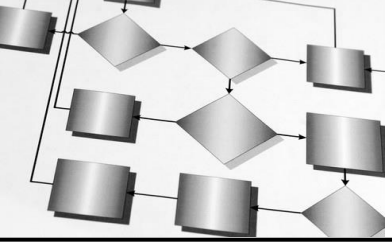


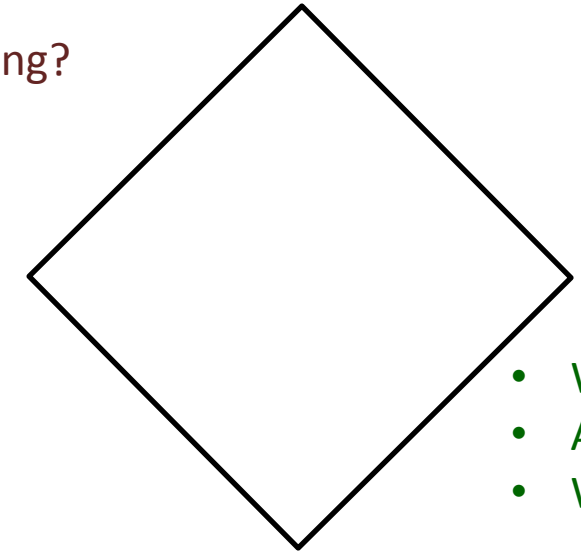
Four components of effective visuals

- What is the explicit objective of this piece of work?
- What will that get you?
- And what will **that** get you?

Purpose

- Is this piece of work compelling?
- Does it build awareness?
- Does it call people to act?
- What is its tone?

Story

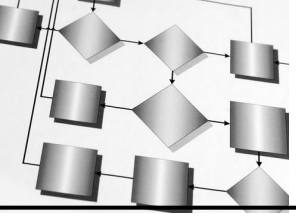


Audience

- Who is this piece of work aimed at?
- Are they prepared to hear it?
- What expectations might they have?

Research

- What is the validity of this piece of work based on?
- Who will see it as credible and why?
- How might its substantiation be challenged?



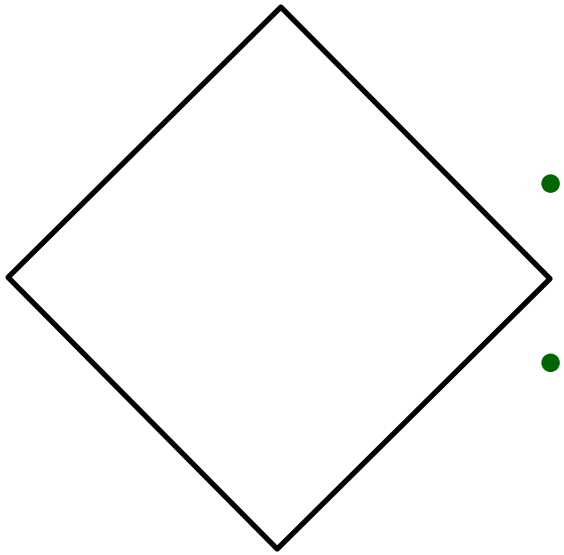
For our purposes there are two options at each corner that will guide our development of a visual

- A call to action
  or
- Raise awareness about an issue

Purpose

- The moral imperative
  or
- We can make a difference story

Story

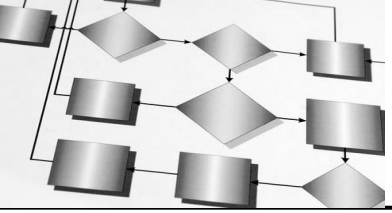


Audience

- Pedestrian audience
  or
- Expert audience

Research

- Highlight your findings
  or
- Validation required



Back to our four corner model

Informs choice of color schemes for the visual

Purpose

The flow and sequencing of elements in the visual

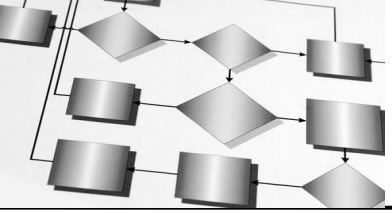
Story

Audience

How much information & layering permitted in the visual

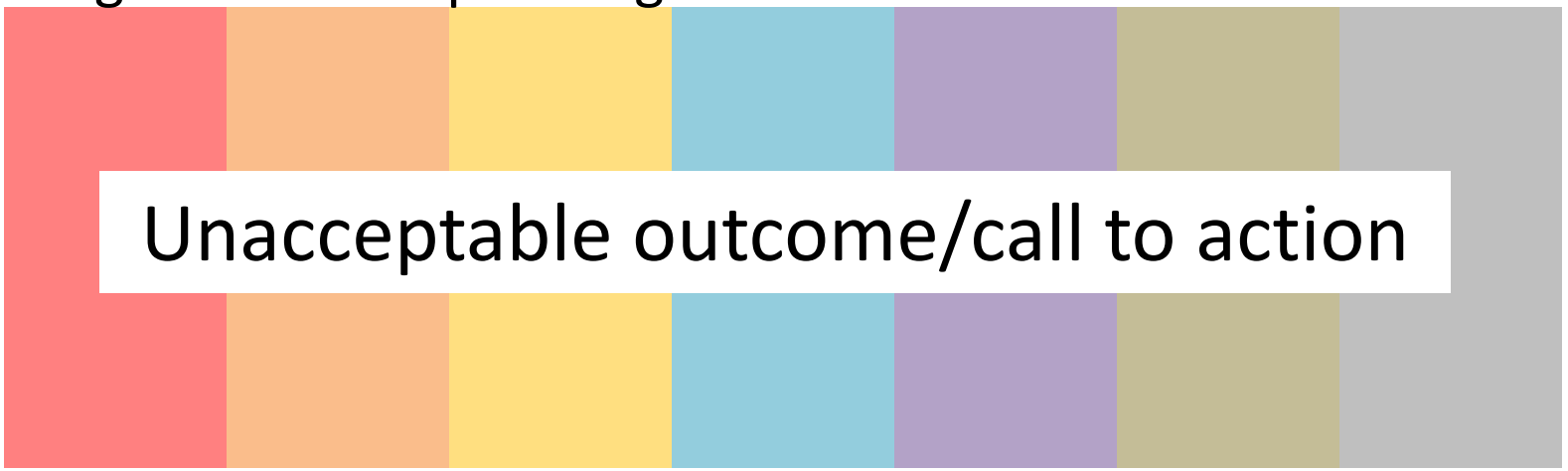
Research

How much text & data to include and choice of language

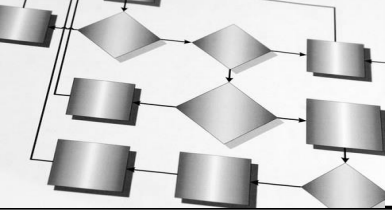


Purpose: color sequencing

Bright to dull sequencing



Dull to bright sequencing



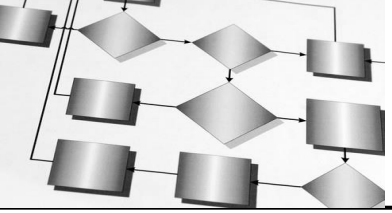
Audience: how much too explain

Pedestrian Audience

- Simplify. Show only what's absolutely needed
- Raw numbers trump percentages
- One left-to-right pathway pointing to one outcome

Audience of Experts

- Can tolerate more process & visual nuance
- Often require proof in your visual that you understand complexities
- If complex, highlight each "chapter" in the visual narrative



Research: how much validation

Continuum: how much you have to show/explain

Low Validation needs

High Validation needs

US Today

Less Text

Larger Text

Bold Lettering

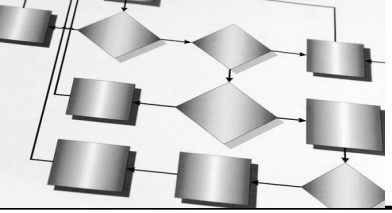
everyday vernacular

Will tolerate more explanatory text

and even more data

Use softer color and smaller fonts to not distract from the main story

Prefer formal names of processes and structures



Story: flow and endpoint

The success story

The visual narrative should start

here

here

here

here

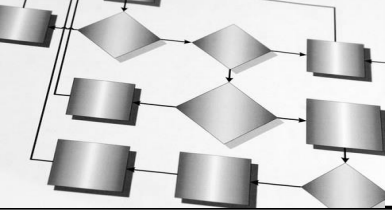
here

or

here

Most impact

The visual flow should be left to right and/or bottom up



Story: flow and endpoint

here

or here

here

here

here

here

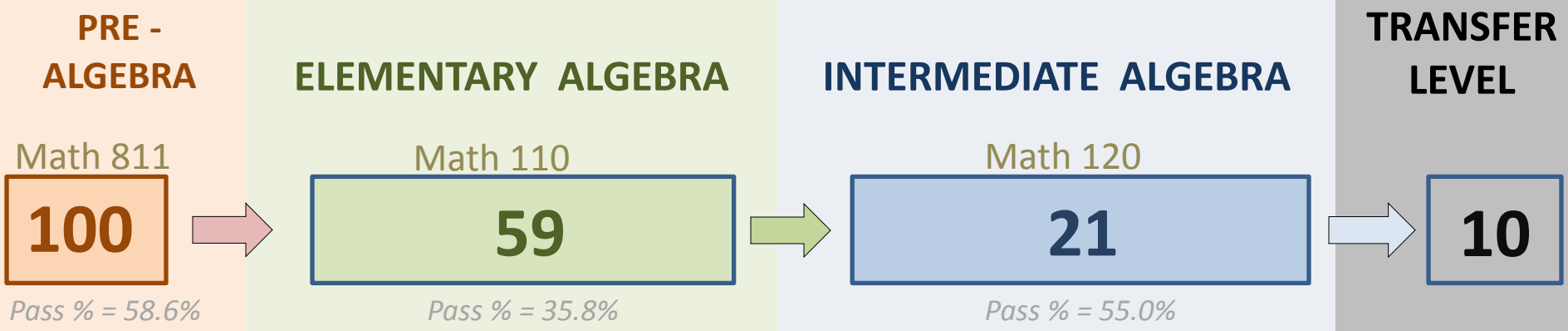
Most impact

We have a problem/ call to action story

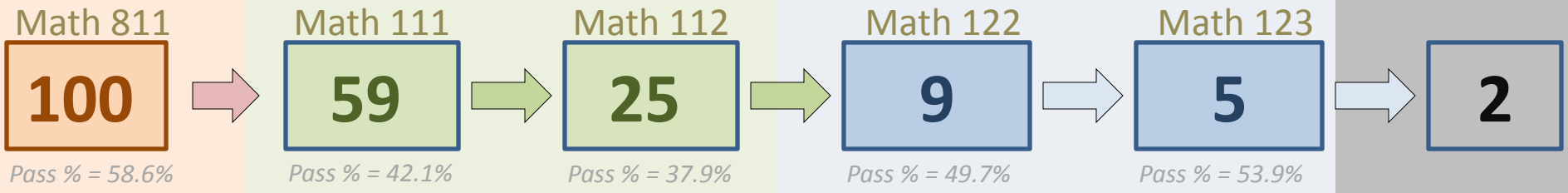
The visual flow should be left to right and/or top down

This will be our reference visual for applying & testing each guideline

Short Sequence



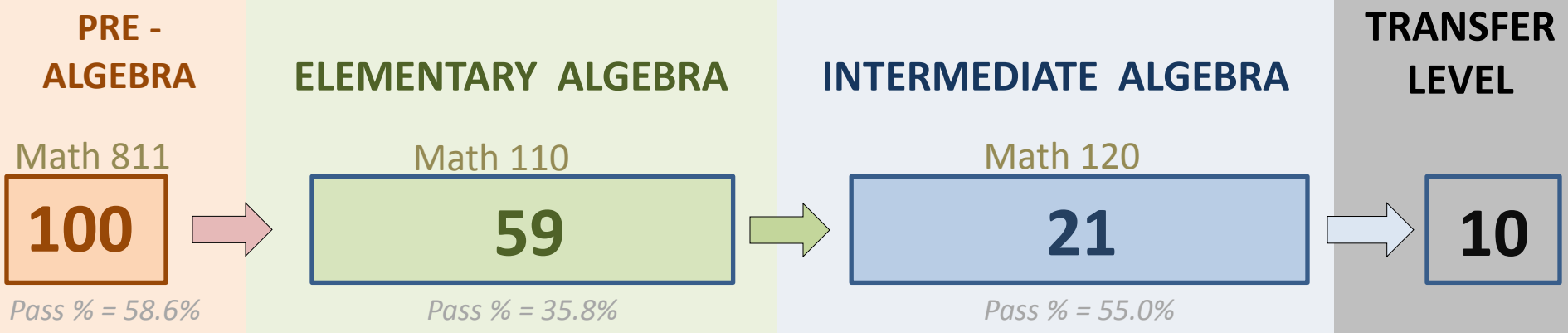
Long Sequence



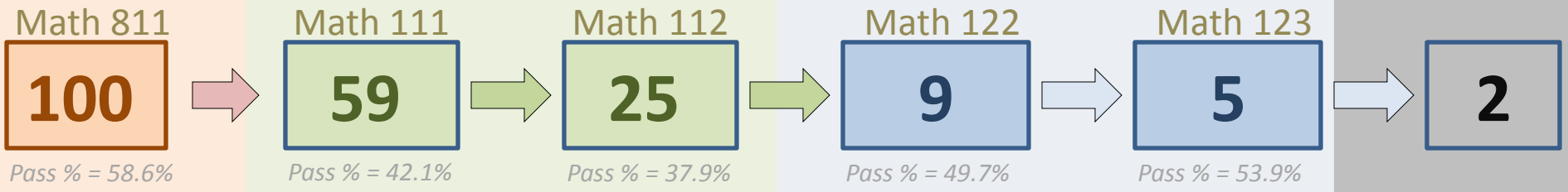
The individual elements of the visual narrative

Given 100 students starting in Pre-Algebra, how many will reach transfer level math?

The color scheme reflects the tone, sequencing with the plot, from brighter colors to darker ones

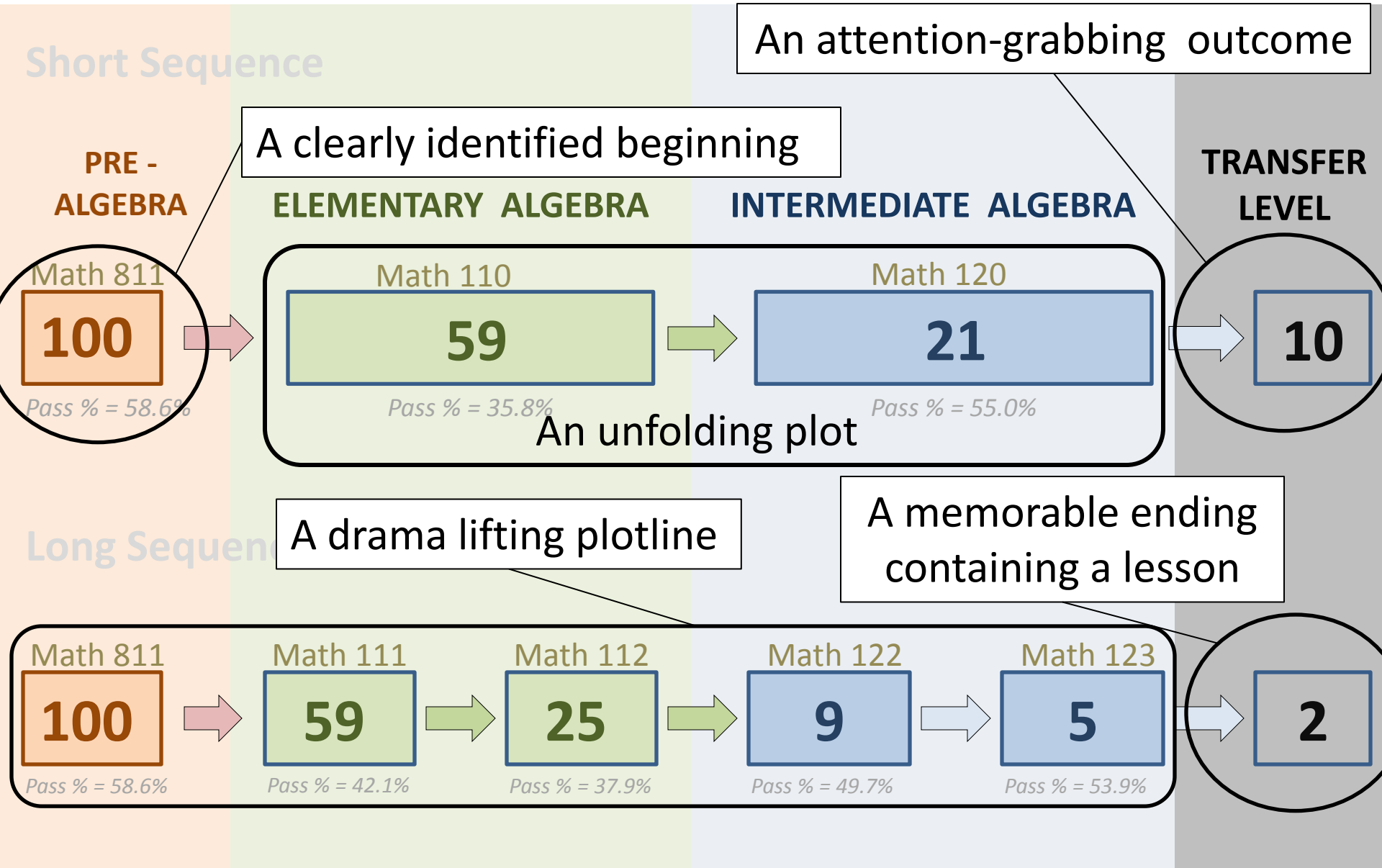


Informational text of interest to the informed viewer has been softened as not to distract from the primary story of interest to the broader audience



The individual elements of the visual narrative

Given 100 students starting in Pre-Algebra, how many will reach transfer level math?



Using layers to add depth to the story

1st Layer – orient the viewer to the environment

2nd Layer – orient the viewer to the primary players

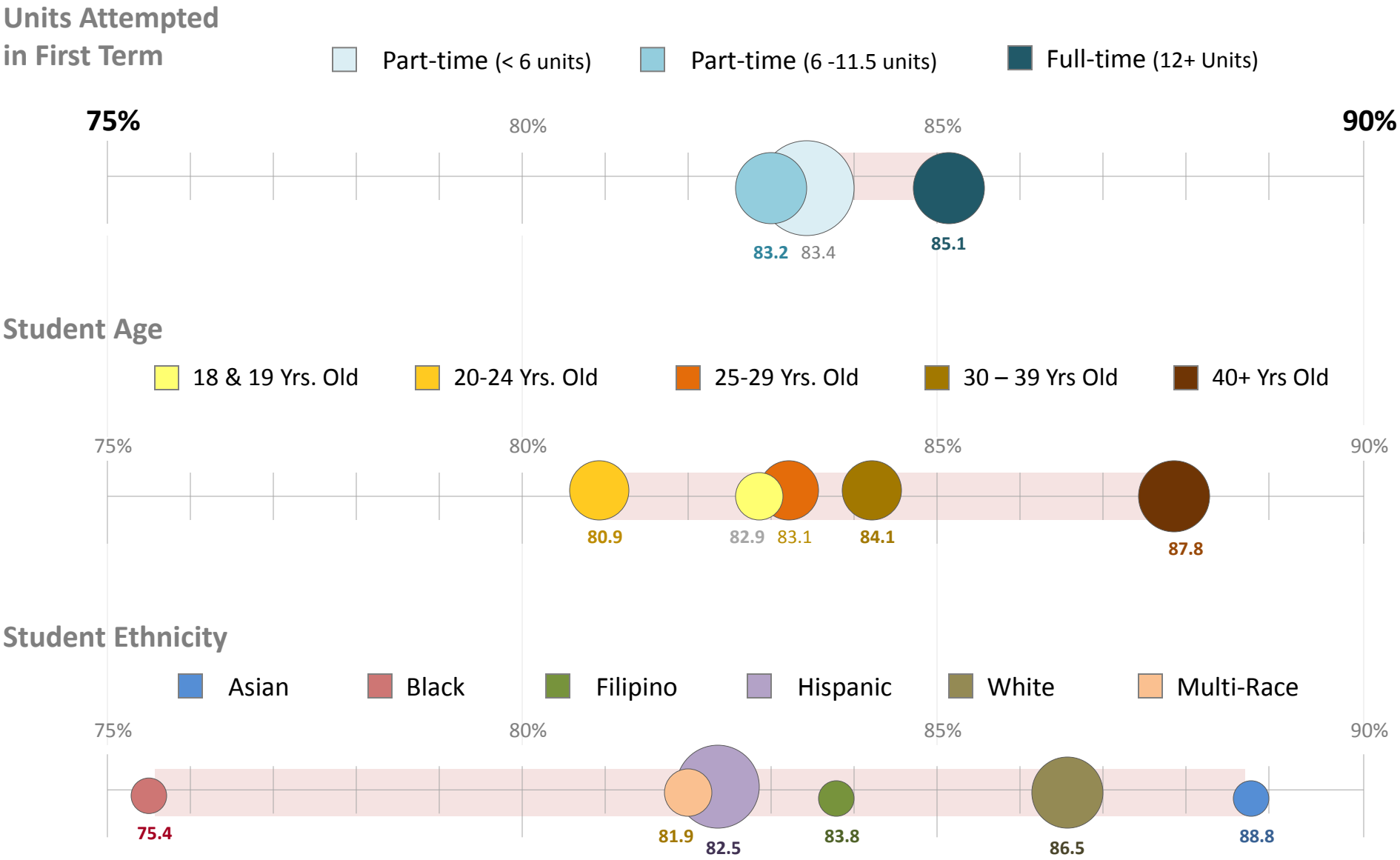
3rd Layer – explain the relative positioning of players

4th Layer – give the players action / assign an outcome

5th Layer – here endeth the lesson

College Retention Rate by category

(Academic Year 2013/14)



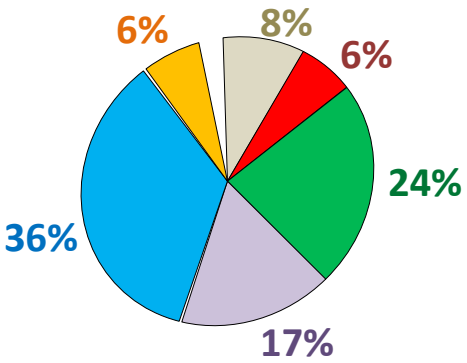
Note: Area of each circles corresponds to the relative number of students in each group.

Student Segments

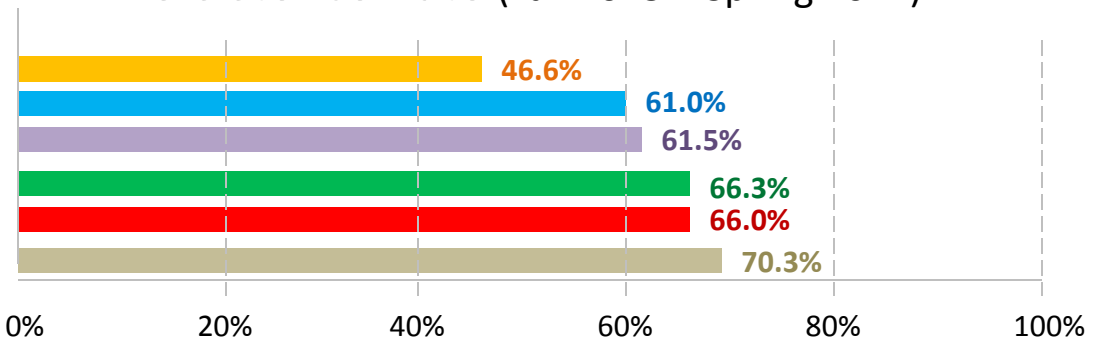
Fall 2013
Headcount

Dual Enrolled
ESL
Basic Skills
Career/Tech
Transfer
Lifelong Learner

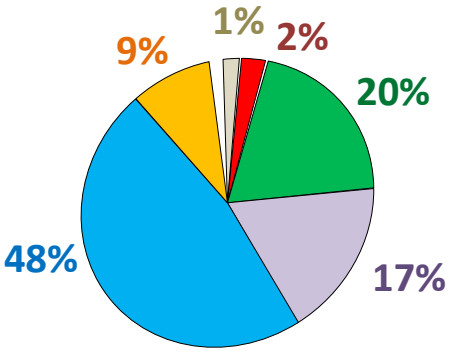
CCC

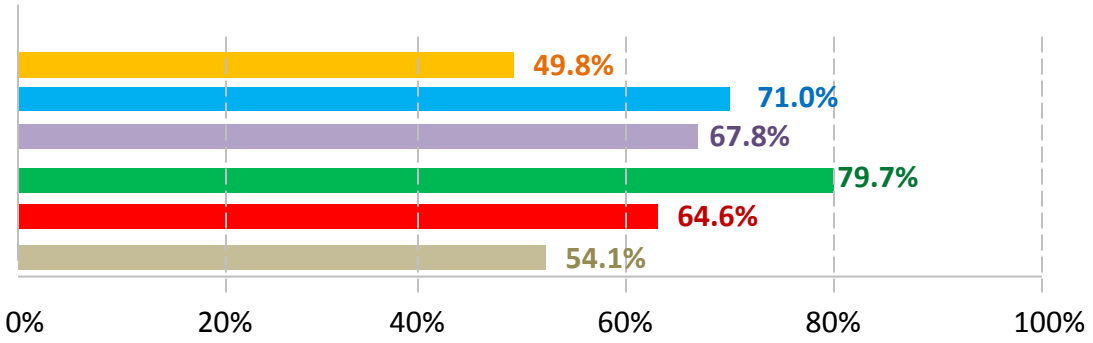


Persistence Rate (Fall 2013 – Spring 2014)

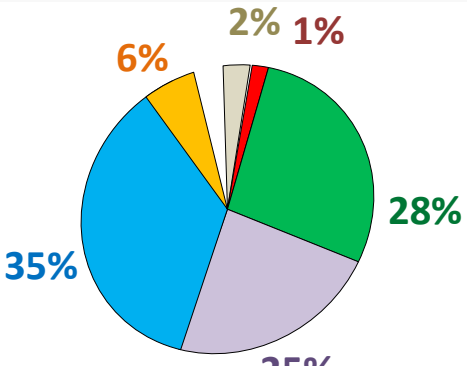


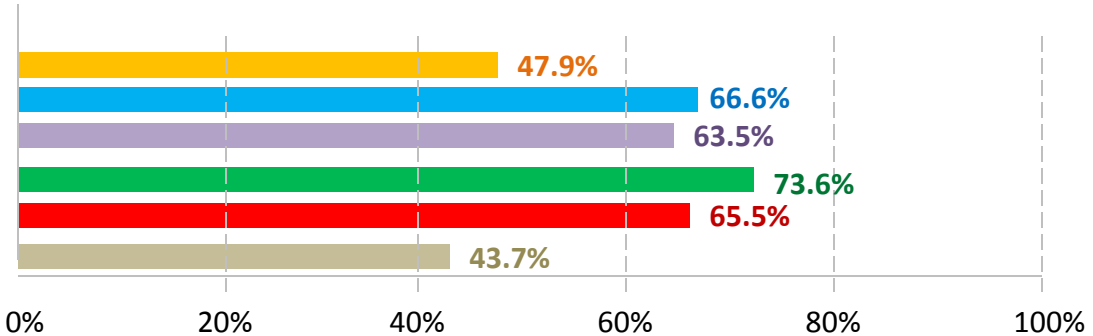
DVC

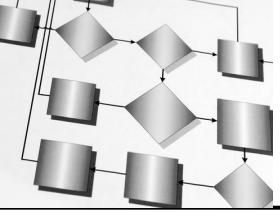




LMC







Choices that improve retention

Research in cognitive science has revealed certain relationships between information and levels of cognitive processing.

Increased retention → **When data is structured to highlight one message**

Increased understanding → **When people can clearly visualize a process**

Increased reflection & sharing → **When data is linked to a compelling story**

Source: Edward Tufte, The Visual Display of Quantitative Information Graphics Press; 2 edition (2001).

Audience Retention & Engagement

Results from an experiment on the impacts of display type on data interpretation and retention.

The Design

- Randomly select three groups of equal size with roughly equal representation from faculty and administrators.
- Each group was shown identical data on algebra course sequence completion.
- Each group received identical narration but given the data in one of three output designs
- Each group was given two minutes to discuss the data
- Participants were surveyed on what they remembered and took away from the information presented to them.

Research Investigation

Exhibit A

Percent of Students Successfully Completing the Algebra Sequence within 2 to 5 Years

Initial Course Placement	2 Years	3 Years	4 Years	5 Years
Pre-Algebra	**2.3%**	**3.6%**	**5.4%**	**6.1%**
Elementary Algebra	**15.5%**	**19.1%**	**20.6%**	**22.4%**
Math 110	19.1%	21.9%	23.2%	23.7%
Math 111	11.8%	16.2%	17.9%	19.1%
Intermediate Algebra	**43.4%**	**47.6%**	**49.2%**	**49.2%**
Math 120	57.0%	58.8%	59.6%	59.6%
Math 122	29.7%	36.4%	38.7%	38.7%

Research Investigation

Exhibit B

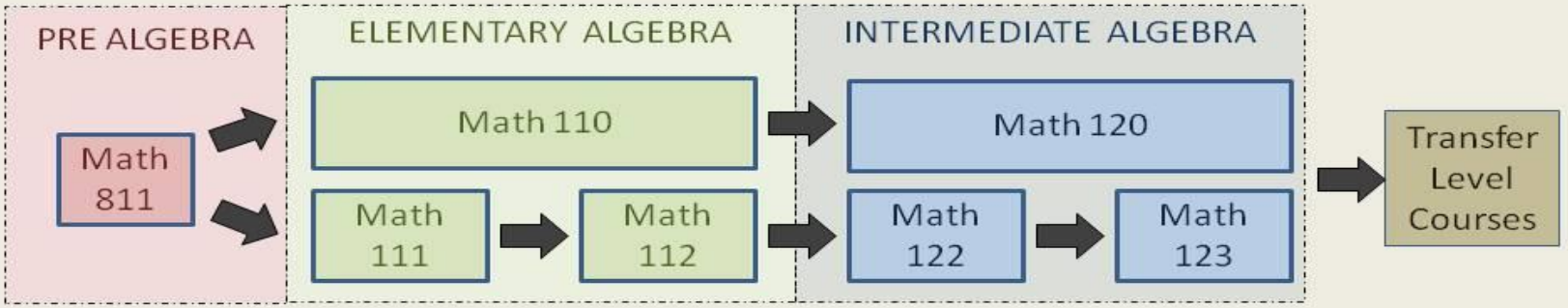
Percent of Students Successfully Completing the Algebra Sequence within 2 to 5 Years

Initial Course Placement	2 Years	3 Years	4 Years	5 Years
Pre-Algebra	**2.3%**	**3.6%**	**5.4%**	**6.1%**
Elementary Algebra	**15.5%**	**19.1%**	**20.6%**	**22.4%**
Math 110	19.1%	21.9%	23.2%	23.7%
Math 111	11.8%	16.2%	17.9%	19.1%
Intermediate Algebra	**43.4%**	**47.6%**	**49.2%**	**49.2%**
Math 120	57.0%	58.8%	59.6%	59.6%
Math 122	29.7%	36.4%	38.7%	38.7%

Research Investigation

Exhibit C

Percent of Students Successfully Completing the Algebra Sequence within 2 to 5 years.

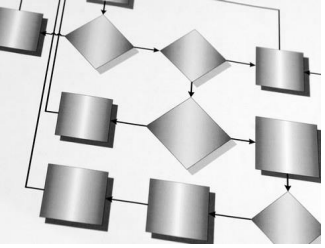


Initial Placement	2 years	3 years	4 years	5 years
811	2.3%	3.6%	5.4%	6.1%
ELEMENTARY ALGEBRA	15.5%	19.1%	20.6%	22.4%
110	19.1%	21.9%	23.2%	23.7%
111	11.8%	16.2%	17.9%	19.1%
INTERMEDIATE ALGEBRA	43.4%	47.6%	49.2%	49.2%
120	57.0%	58.8%	59.6%	59.6%
122	29.7%	36.4%	38.7%	38.7%

Salient Findings

Exhibit A	Exhibit B	Exhibit C
Black & White Table	Color Coded Table	Color Table w/ Graphic
Average retention of independent facts	**More comparisons made across groups**	**More comparisons made across groups and across time**
The problem is environmental & systematic	**This is a big problem & we need to improve initial placements**	**We need to improve initial placements & investigate other related issues**
Solution was tied to acquiring more resources	**Solution was tied to acquiring more resources**	**Solution was tied to acquiring more resources & more innovation at the college**

Source: unpublished research , Office of Planning & Research, Cañada College.



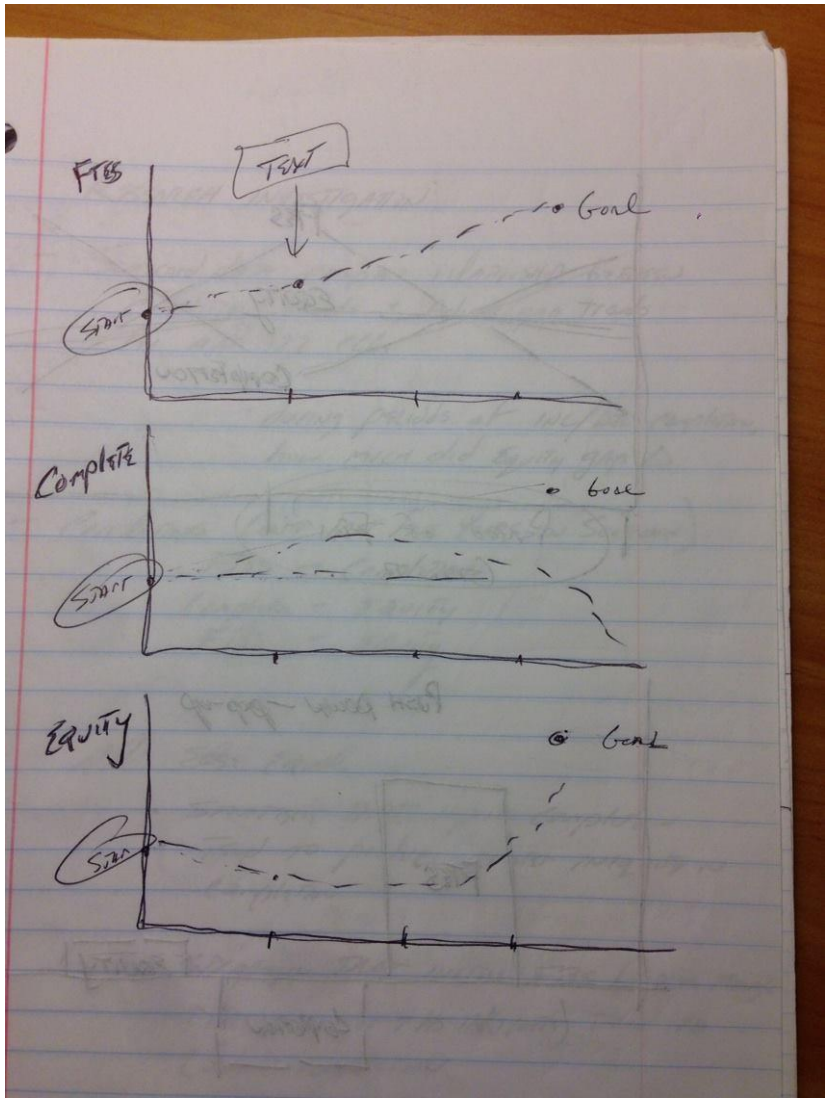
Presentation overview

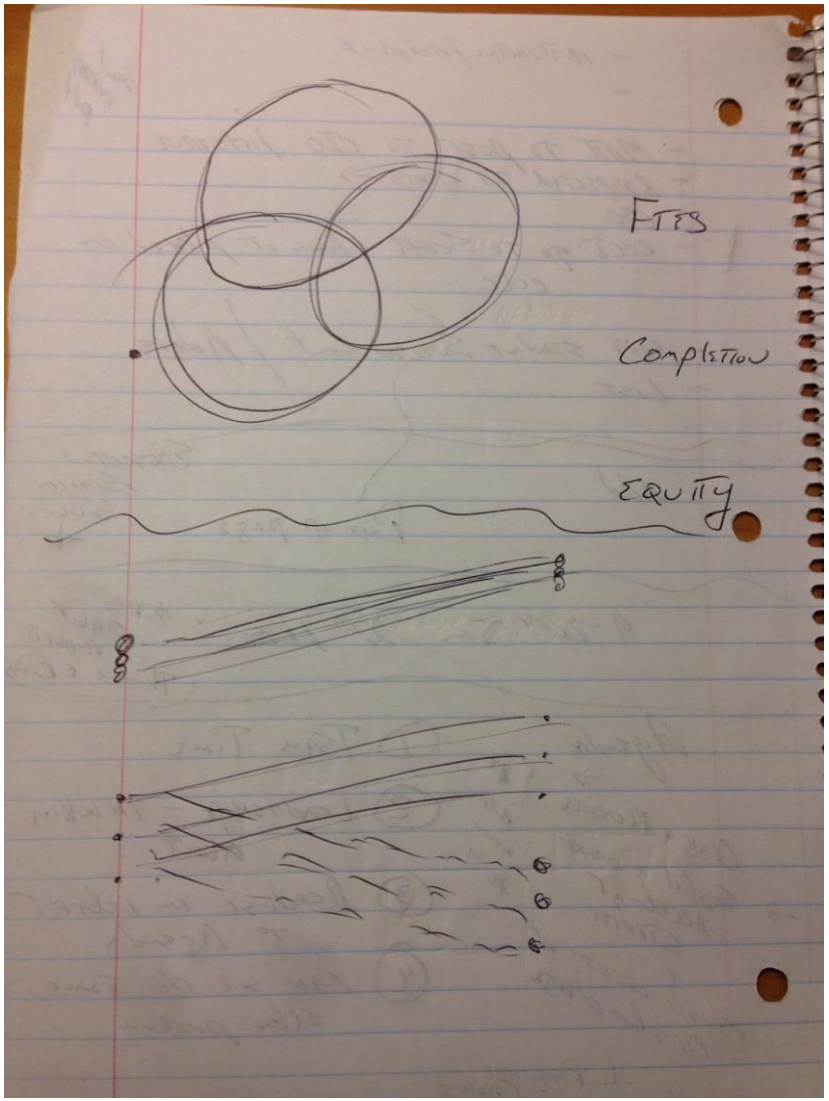
1. Why story telling?
2. Why visuals?
3. Story-based messaging through visuals
4. More than a few examples
5. Guidelines for building an effective visual
6. Designing visuals for greatest impact
7. **Walking through the process**

How do you get there?

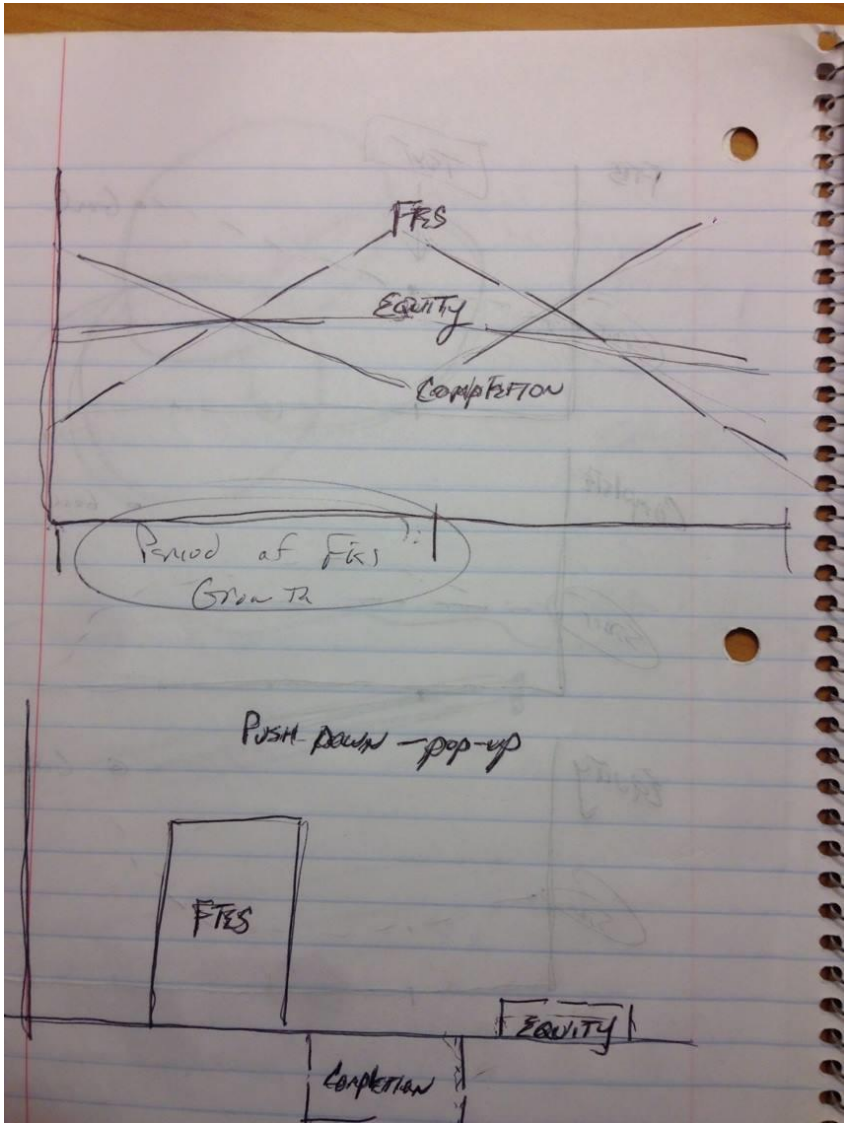
- This is a trial that nearly always begins with a struggle.
- You will produce multiple bad drafts before you brute force your way to a good one
- Start with paper and pen

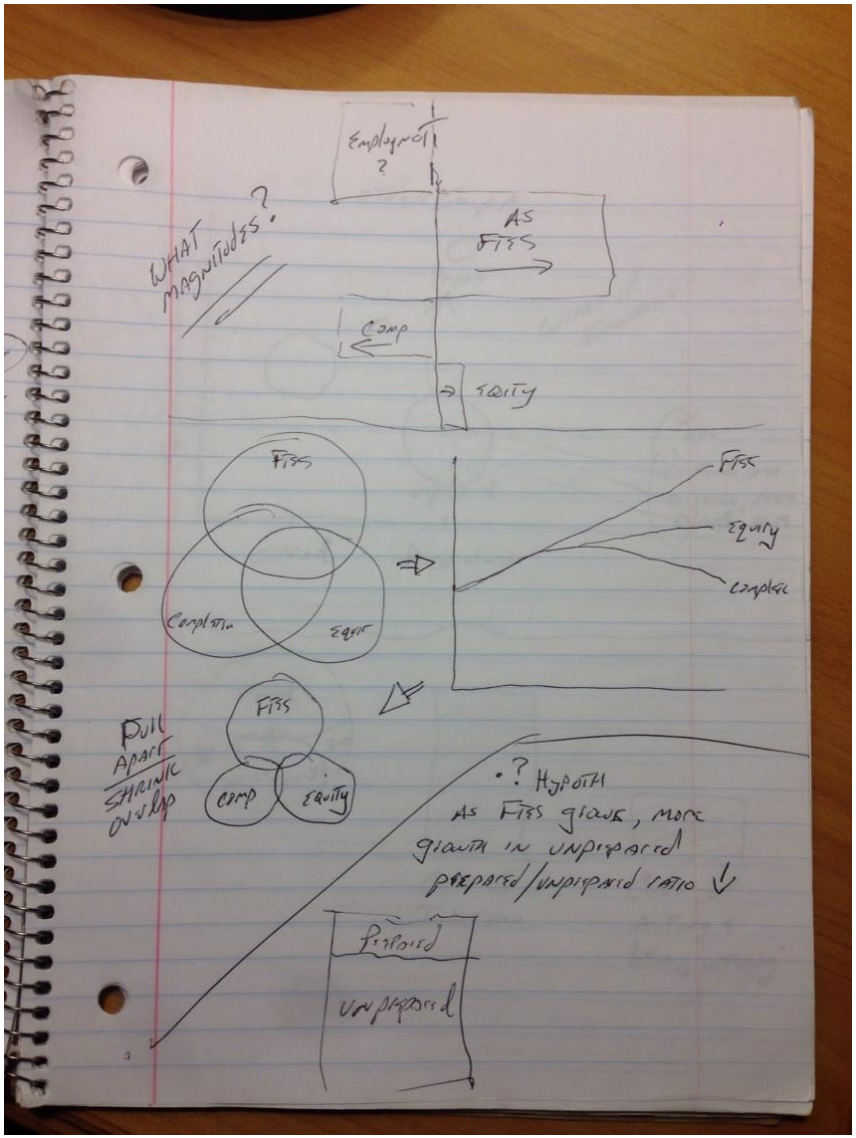
Don’t fear the ugly first draft





Don’t fear the ugly first draft





Our dominant strategies often operate in separate orbits ….

Growing FTES

How do we increase our high school capture rates & student persistence?

Improving Completion

How do we get more students through the completion pipeline?

Closing the achievement gap

How do we improve or scale up our programs that support our under performing student groups?

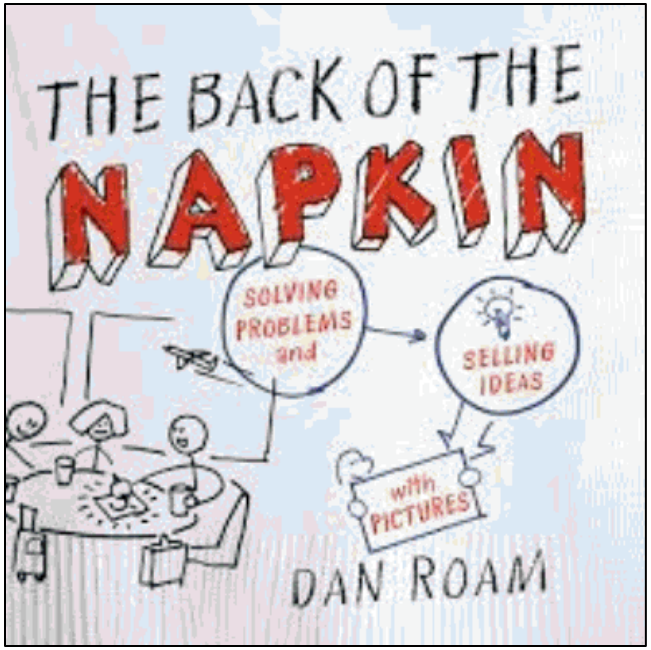
Reframing the challenge can help bring about better alignment

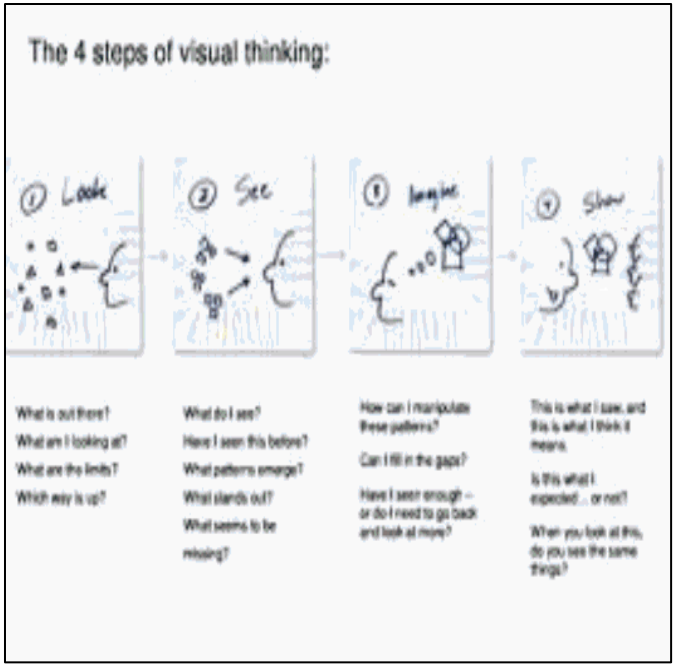
What FTES and completion strategies support the equity outcomes we are pursuing?

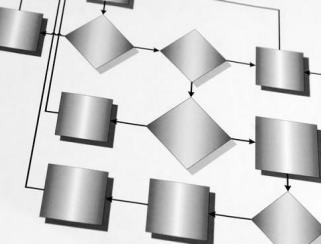
(e.g. bottom-up or win-win)

A source of inspiration & guidance

Back of the Napkin
by
Dan Roam







Presentation overview

Some examples

The questions we ask convey how we see the world

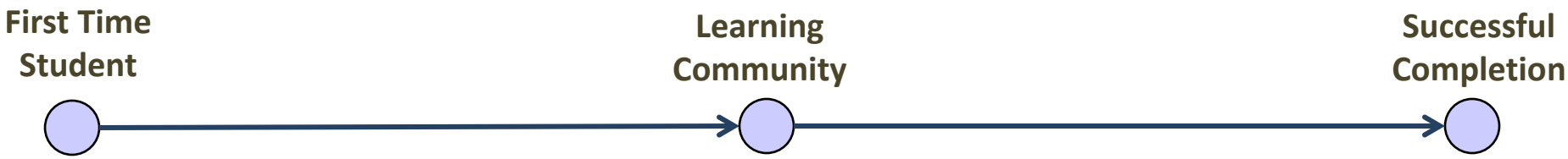
How do we increase the college completion rate?

The questions we ask convey how we see the world

How do we get more students through the completion pipeline?

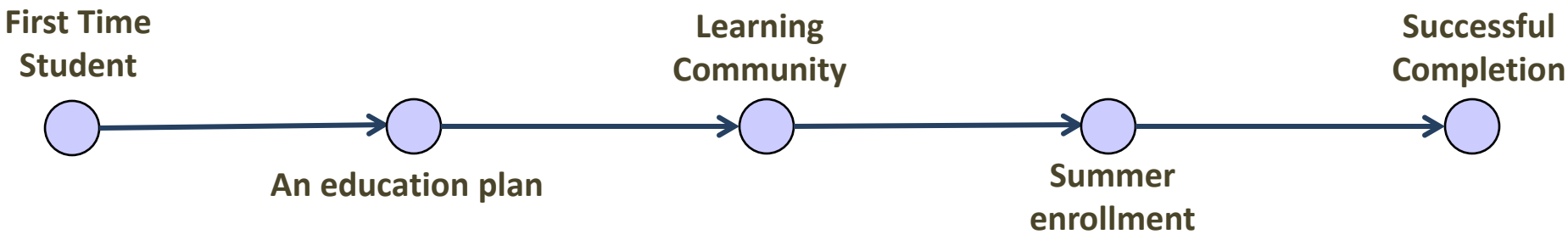
The questions we ask convey how we see the world

What programs do we have to increase student completion?



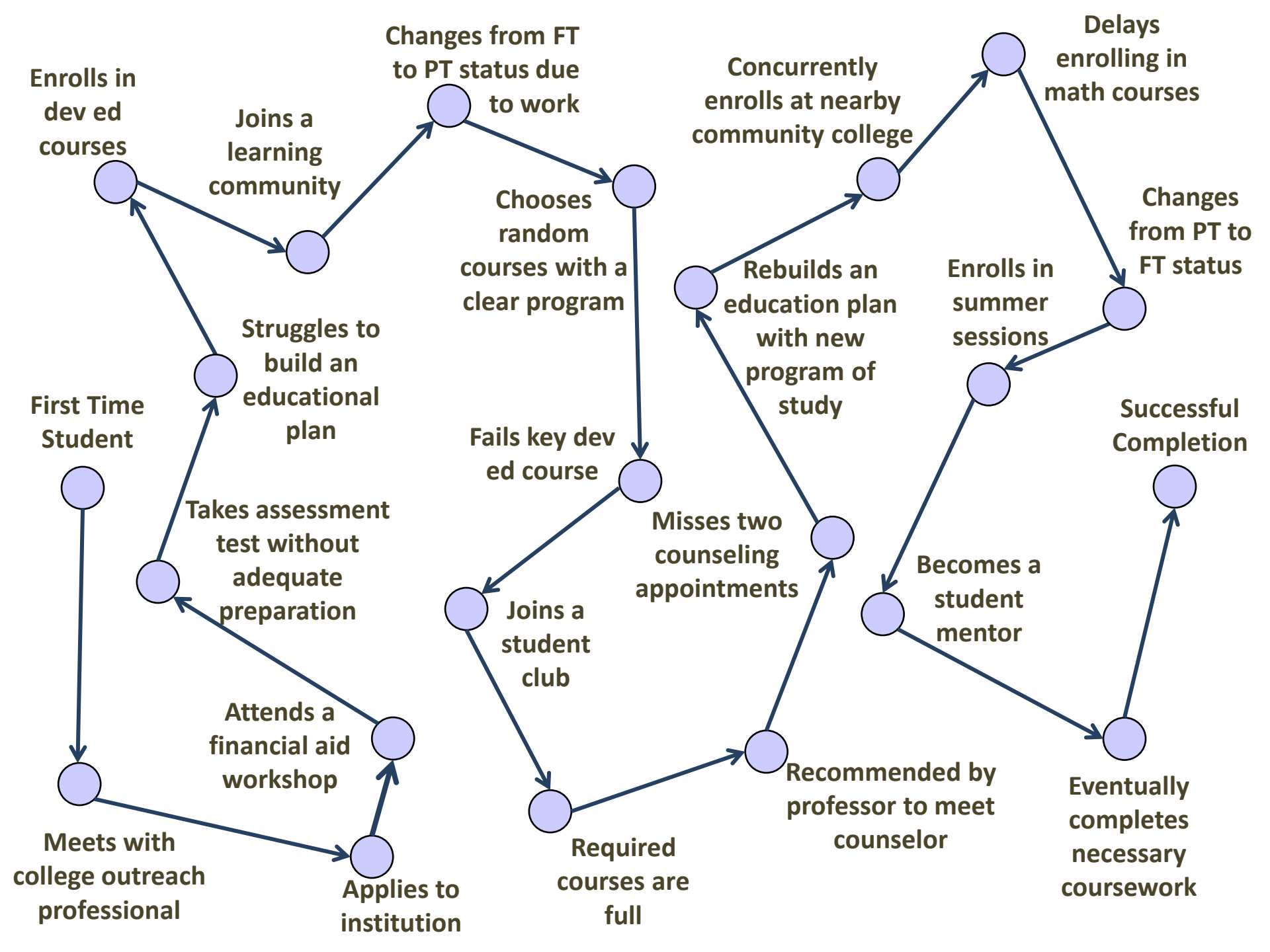
The questions we ask convey how we see the world

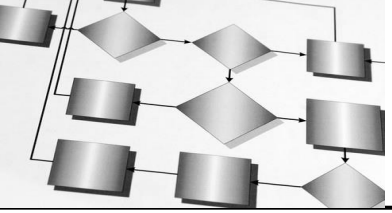
What helps students reach completion?



The questions we ask convey how we see the world

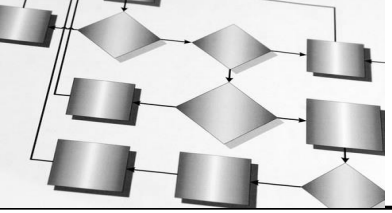
What is the student experience?


First Time Student
Meets with college outreach professional
Attends a financial aid workshop
Applies to institution
Takes assessment test without adequate preparation
Struggles to build an educational plan
Enrolls in dev ed courses
Joins a learning community
Changes from FT to PT status due to work
Chooses random courses with a clear program
Fails key dev ed course
Joins a student club
Required courses are full
Recommended by professor to meet counselor
Misses two counseling appointments
Rebuilds an education plan with new program of study
Concurrently enrolls at nearby community college
Delays enrolling in math courses
Changes from PT to FT status
Enrolls in summer sessions
Becomes a student mentor
Eventually completes necessary coursework
Successful Completion



Tracking student progress through the basic skills sequence to identify interventions

3 Levels Below Transfer	2 Levels Below Transfer	1 Level Below Transfer	Transfer Level
1,000	650	475	400
	- 35 %	*- 27 %*	*- 16 %*



Tracking student progress through the basic skills sequence to identify interventions

3 Levels Below Transfer	2 Levels Below Transfer	1 Level Below Transfer	Transfer Level
1,000	650	475	400
	- 35 %	- 27 %	- 16 %

Profile completers vs non-completers

Cum GPA
Completed SEP
On Fin Aid
Books on First day
Arriving late to class
Missed 3+ classes
Completed homewo
Used Tutoring

Profile completers vs non-completers

Cum GPA
Completed SEP
On Fin Aid
Books on First day
Arriving late to class
Missed 3+ classes
Completed homewo
Used Tutoring

Profile completers vs non-completers

	Continuing	Not Continuing
Cum GPA	2.84	2.58
Completed SEP	66%	54%
On Fin Aid	44%	48%
Books on First day	88%	79%
Arriving late to class	12%	30%
Missed 3+ classes	9%	27%
Completed homework	86%	43%
Used Tutoring	41%	32%

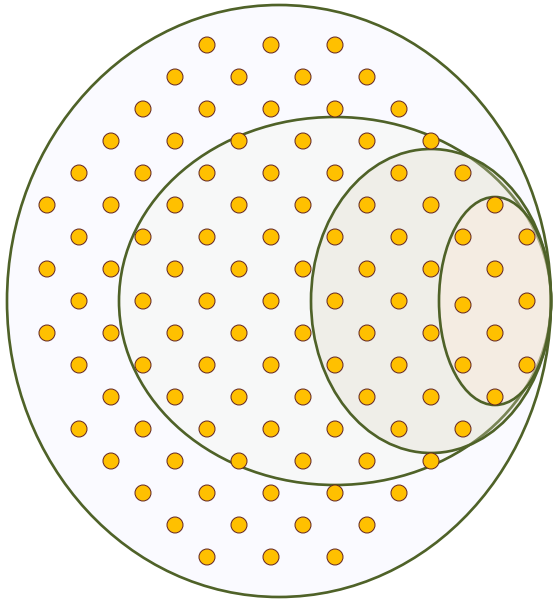
Inquiry framed toward action

Process of inquiry

What to do when you reach the limits of your research and yet still face multiple choices in how to proceed ?

- *Not a search for an absolute truth rather a tool for making better-informed decisions.*

Domain of possible solutions to the question at hand



Answer the questions that eliminate dead end solutions

Trust your intuition & choose !

Basic Skills English Course Sequence

Two Levels below Transfer
ENGL 826

⇨

One Level below Transfer
ENGL 836

⇨

Transfer Level English
ENGL 846

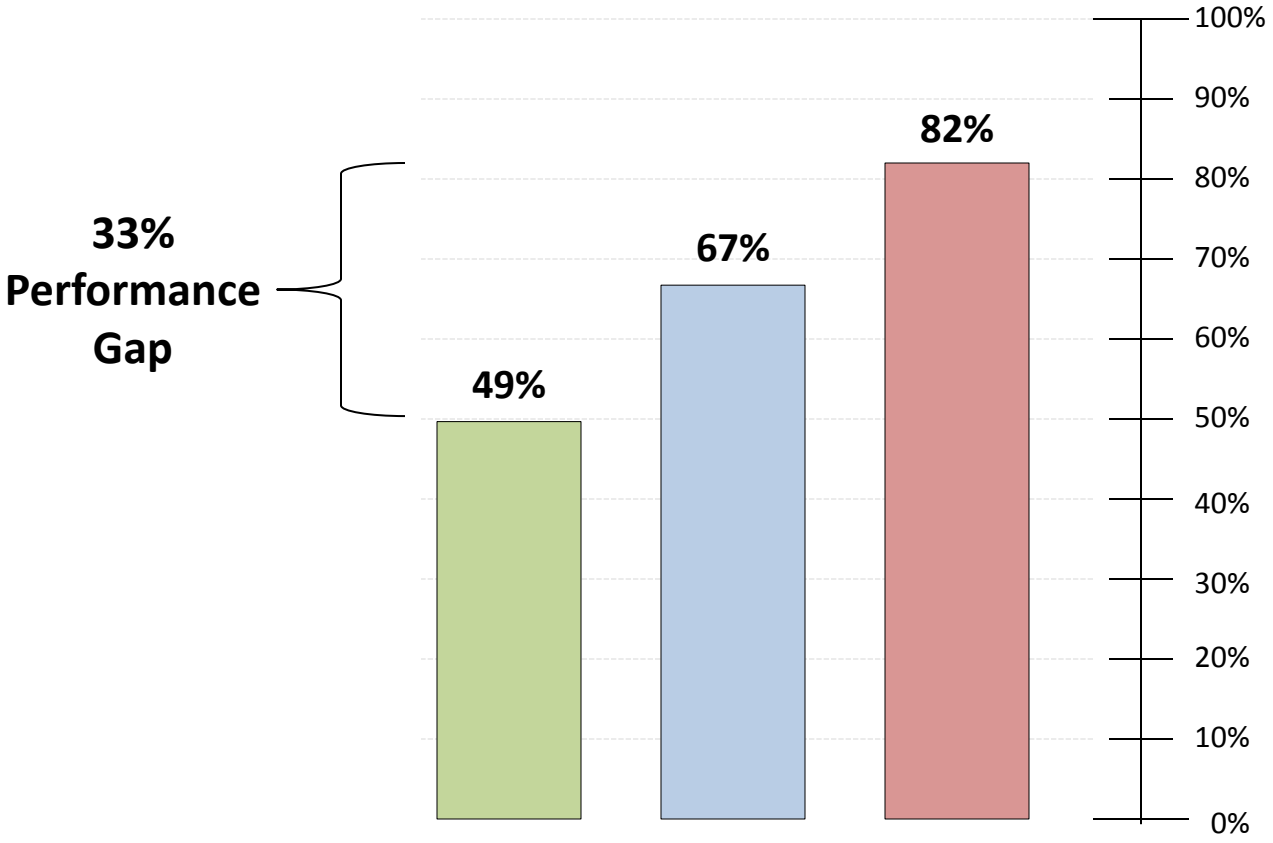
The grade received by students in English 826

A

B

C

Success Rate of those same students in English 836



Basic Skills English Course Sequence

Two Levels below Transfer

ENGL 826

One Level below Transfer

ENGL 836

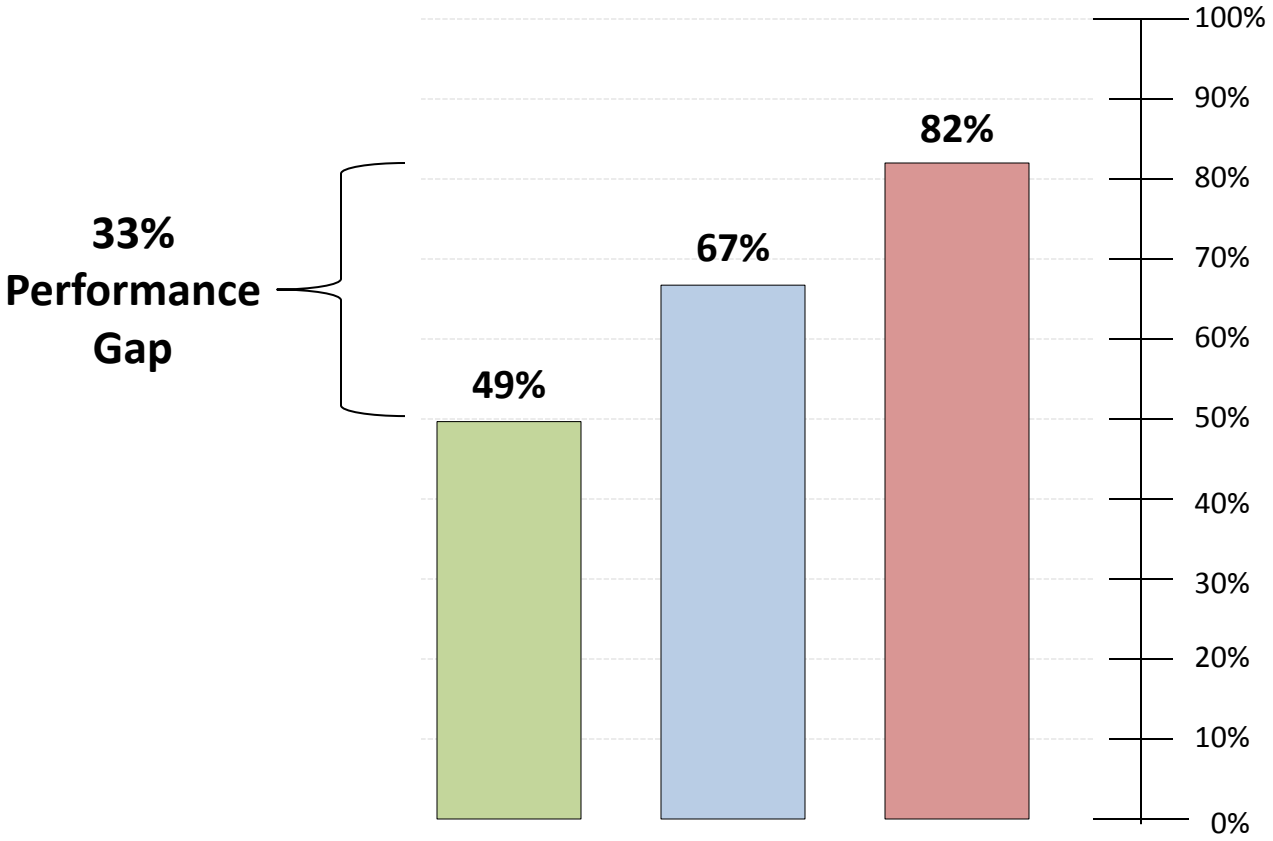
The grade received by students in English 826

A

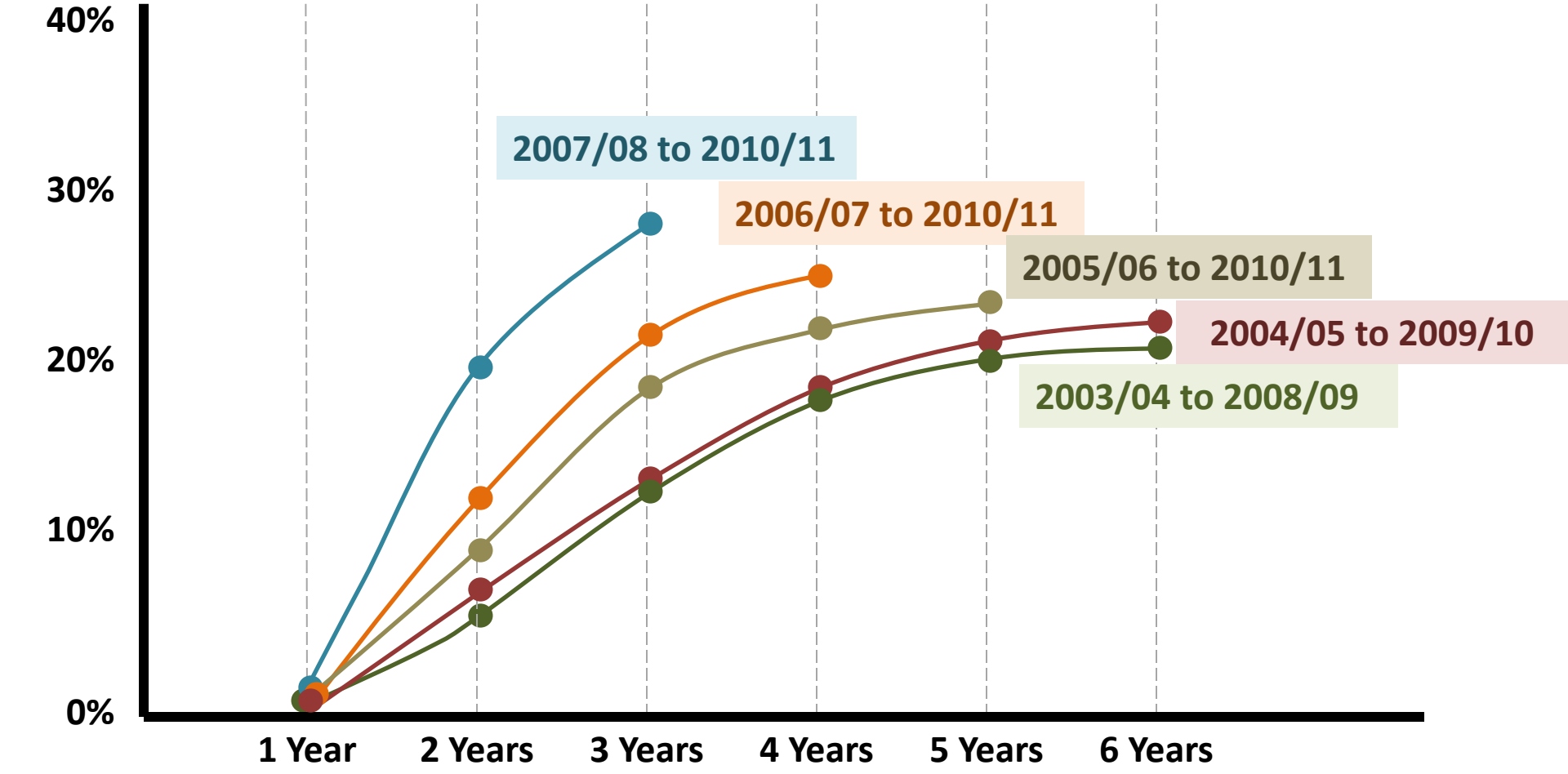
B

C

Success Rate of those same students in English 836



Years to Completion Profiles

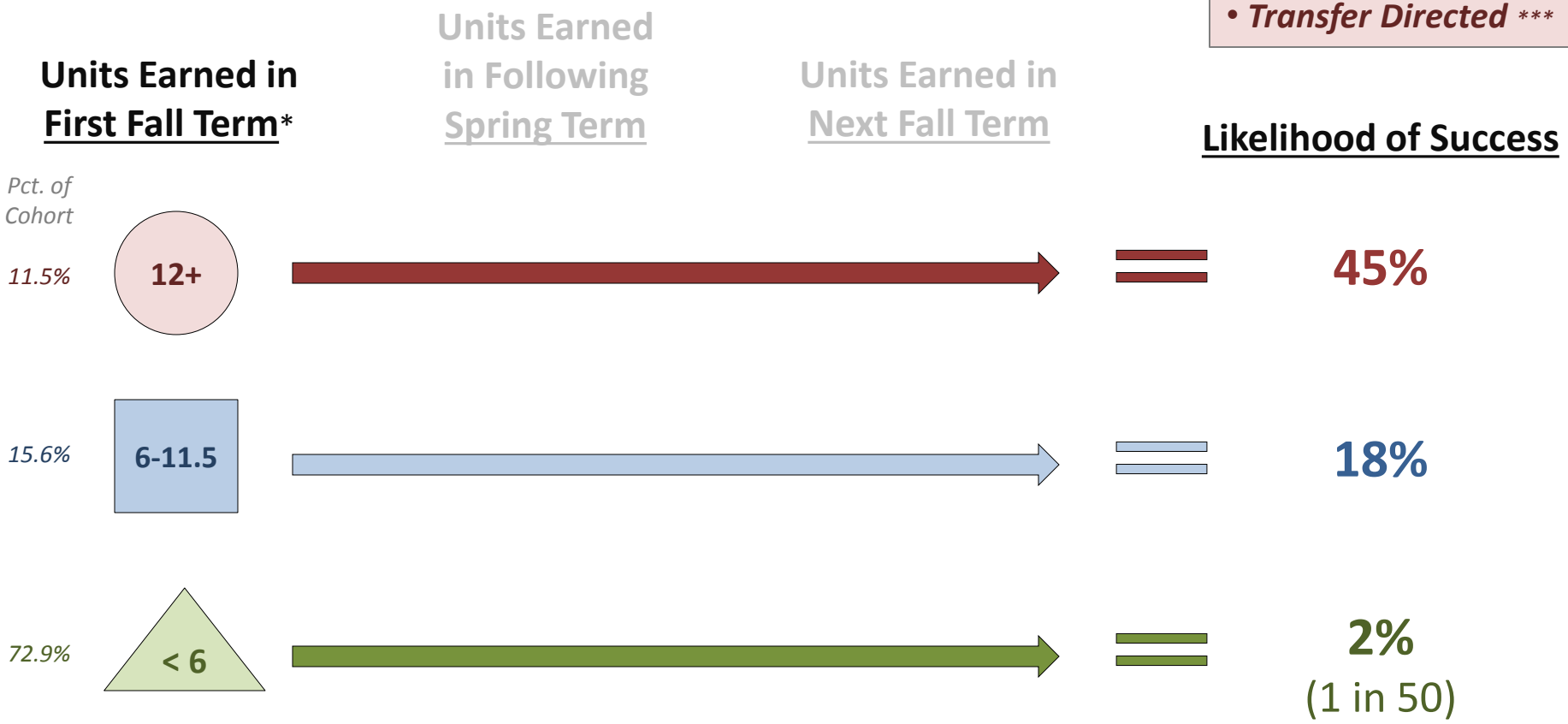


Percentage of first-time degree seeking students with a high school degree but no post-secondary degree and having completed at least 12 units

Likelihood of a Successful Outcome for degree & transfer seeking students for different unit earning pathways

Likelihood given behavior over one term only

Successful Outcomes
- ***Degree***
- ***Certificate***
- ***Transfer Prepared*****
- ***Transfer Directed*** ***

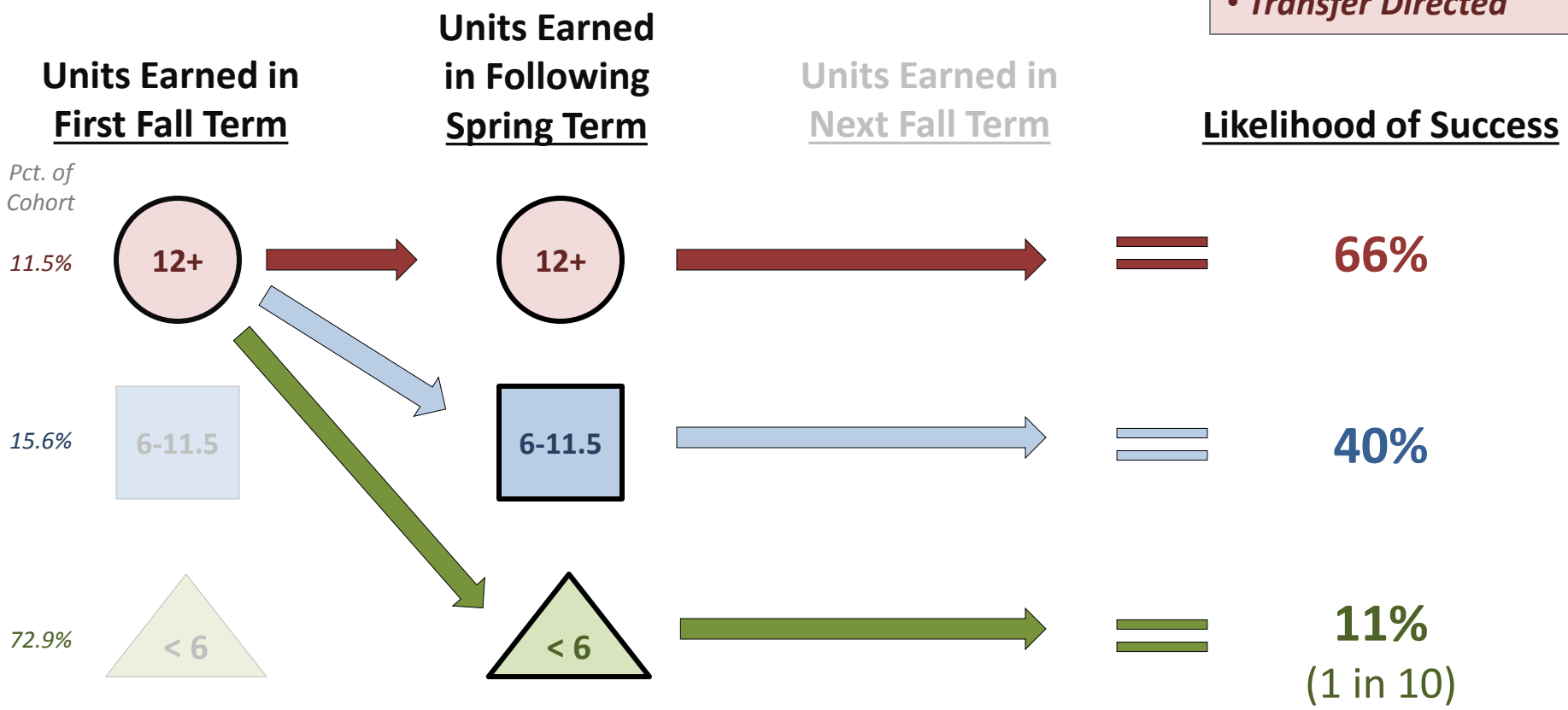


*First Fall term cohort is limited to First-Time students that declared their primary educational goal to be either degree, certificate or transfer.
** Transfer Prepared is defined as students having achieved 60+ units in transferable courses within six years.
*** Transfer Directed is defined as students having completed both a transfer level Math and a transfer level English course. Within six years

Likelihood of a Successful Outcome for degree & transfer seeking students for different unit earning pathways

Likelihood given behavior over two terms

Successful Outcomes
- *Degree*
- *Certificate*
- *Transfer Prepared*
- *Transfer Directed*

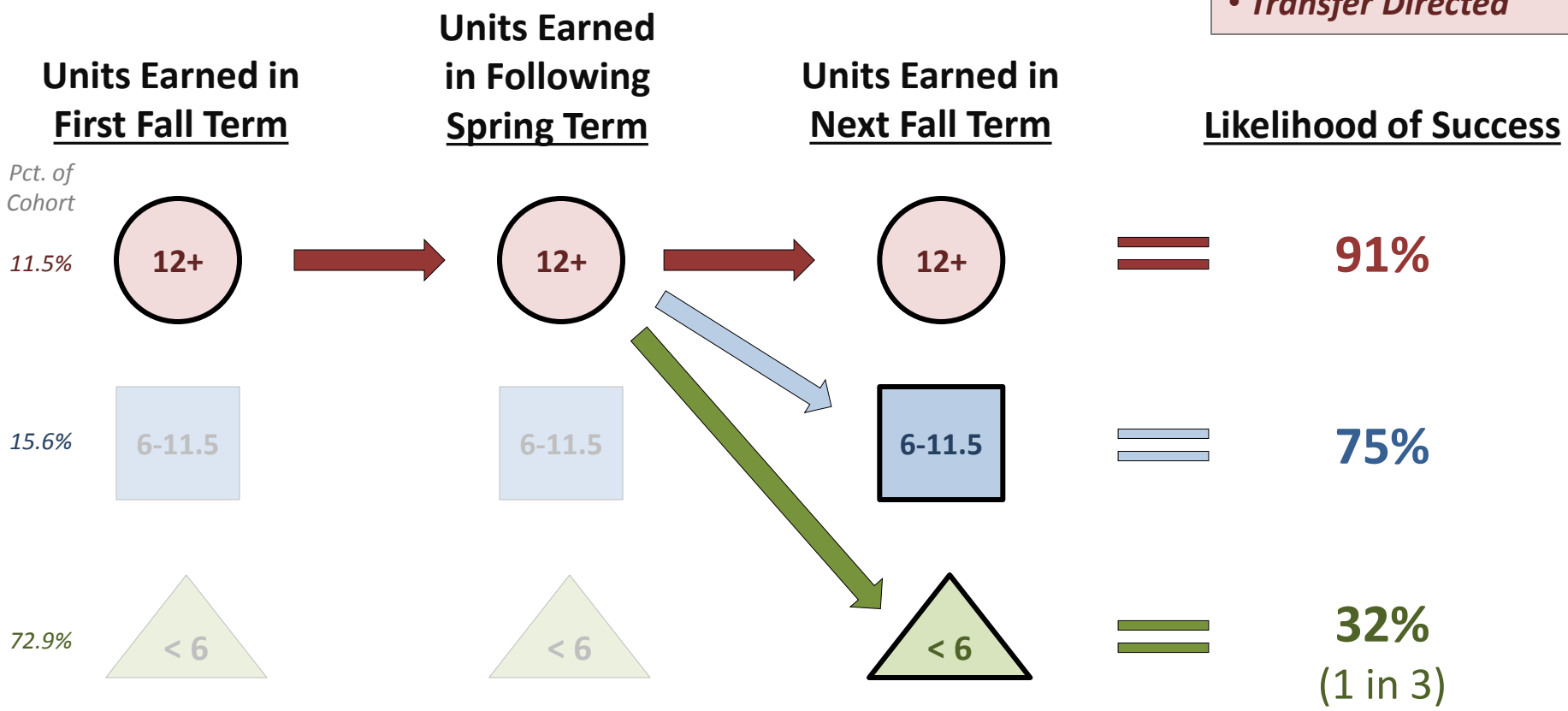


*First Fall term cohort is limited to First-Time students that declared their primary educational goal to be either degree, certificate or transfer.
** Transfer Prepared is defined as students having achieved 60+ units in transferable courses within six years.
*** Transfer Directed is defined as students having completed both a transfer level Math and a transfer level English course. Within six years

Likelihood of a Successful Outcome for degree & transfer seeking students for different unit earning pathways

Likelihood given behavior over three terms

Successful Outcomes
- *Degree*
- *Certificate*
- *Transfer Prepared*
- *Transfer Directed*

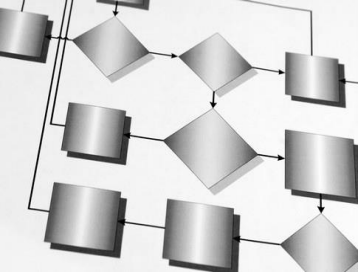


*First Fall term cohort is limited to First-Time students that declared their primary educational goal to be either degree, certificate or transfer.
** Transfer Prepared is defined as students having achieved 60+ units in transferable courses within six years.
*** Transfer Directed is defined as students having completed both a transfer level Math and a transfer level English course. Within six years

Final thoughts

Yours, not mine ;)

Any comments, reactions?

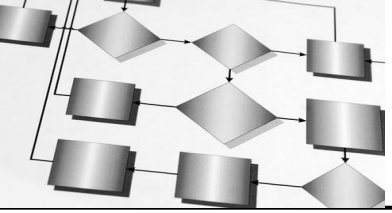


OACC Symposium

It has been a pleasure

November 14, 2014

Gregory M Stoup
gstoup@4cd.edu
Sr. Dean Contra Costa Community College District
Vice President, RP Group of California



Scholarship on Effective Visuals

- Footnotes & list of references in appendix
- Many sources but most of this content is derived from a Few:
  - Stephen Few (*The Effective Visual Communication of Data*)
  - Edward Tufte (*The Visual Display of Quantitative Information)*
  - Nancy Duarte (*Resonate: Visual Stories that Transform Audiences)*
  - Stanford Institute of Design (the d.school)
  - My own wanderings, failures, and experiences.

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