



Using Writing and Presentations to Develop Critical Thinking and Reflection in Math Courses

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CALIFORNIA ACCELERATION PROJECT

<http://cap.3csn.org/>

Supporting California's 112 Community Colleges To Redesign Developmental English and Math Curricula And Increase Student Completion

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Low Stakes: Journal Writing

My experience in math, have been a total roller coaster. Past math classes made me feel insignificant. I felt like I couldn't achieve my goals. I was discouraged. That's why I decided to take pal and seriously buckle down and have math everyday. I knew coming in to pal was going to be challenging but I was ready. I take responsibility for the grades I gotten thus far. I know that who I was is not the person I am today. It has been challenging but I seem to love math each day more and more. I feel that Math 075 and 140 pal course has made me see math differently. Its challenging enough but at the same time easy to understand. This is the math I've been looking for, for example relating to life around us. We can actually use these concepts

Low Stakes: Journal Writing

At the beginning of the semester

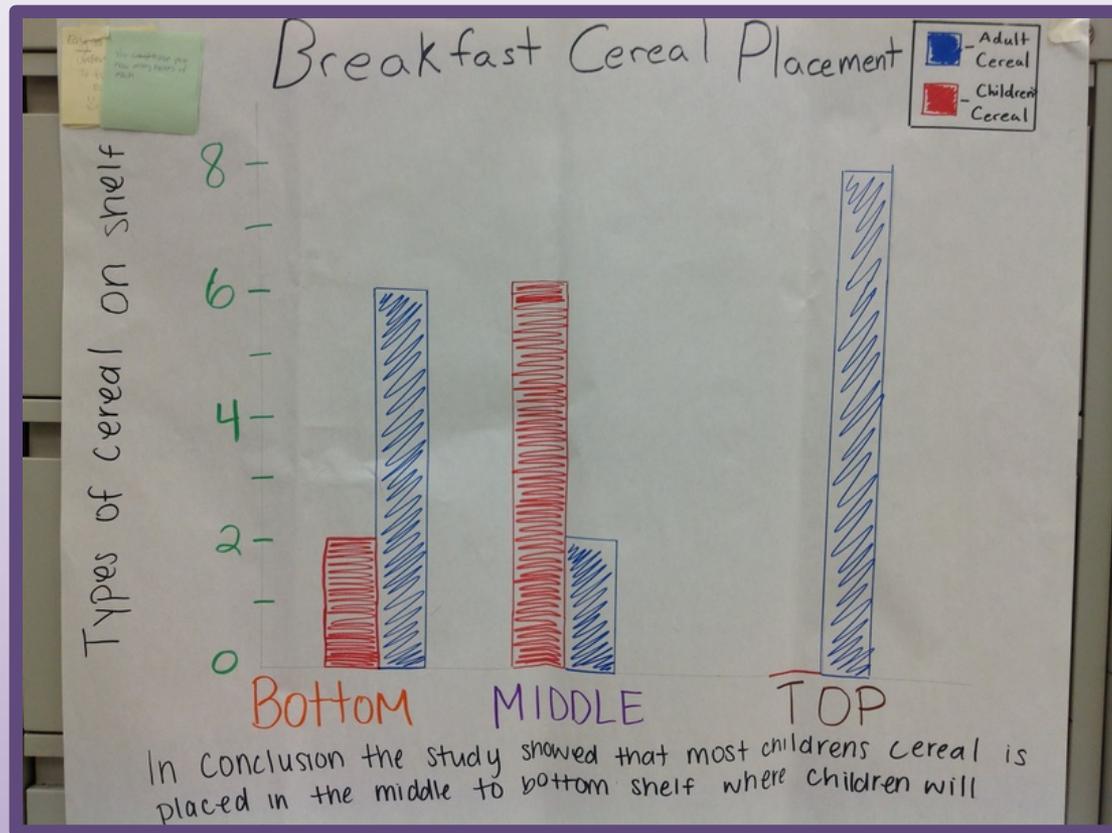
Introduce Carol Dweck's Brainology article
(fixed vs. growth mindsets)

Revisit mindsets throughout the semester
via journal writing assignments

Low Stakes: Journal Writing

Please read the student journal example from the end of the semester (refer to the assignment prompt on the handout).

Moderately Low Stakes: Poster Presentations



Poster Presentations

Completed within one or two class sessions

- **Provide a data set for students to analyze**
- **State a specific goal on which students will focus their analysis**

Supplies

- **Poster paper**
- **Colored pens, scissors, rulers**
- **Masking tape**
- **Sticky notes (2 colors)**

Poster Presentation Guidelines

Divide the class into groups (3 or 4 per group).

Set a specific amount of time for data analysis/poster prep.

- **Presenters: Choose a group presenter to share the group findings (2-3 minutes). Switch the presenter for each round.**
- **Listeners: At the end of the presentation (2 minutes)**
 - Yellow: Write something you liked or learned**
 - 2nd color: Write a suggestion for improvement or a question you have about the presentation.**

Reflection: Allow students to review and discuss feedback from sticky notes

Auto Safety Posters (Week 4)

You work for an automobile insurance company, and your job is to minimize costs for the company. Your boss has assigned you the task of reviewing recent auto safety records and determining how that information may be relevant to the company.

Data: Vehicle categories, safety ratings (insurance injury loss)

Prepare a poster presentation for your boss that includes:

- appropriate comparative graph(s) and a five-number summary (using Minitab);
- descriptions of the injury ratings for each group of cars;
- a comparison of injury ratings for the three sizes of cars;
- your recommendation to your boss about your company's insurance policies.

The Process

We formed 6 groups in most classes.

3 groups simultaneously presented their posters while the other 3 listener groups rotated to each poster (3 rounds). Then switch roles for the 2nd set of posters.

Presenters Information (repeated practice with communicating ideas)

All group members remain with their poster to give a 2-3 minute presentation of their findings. Thus, the presenting group has 3 opportunities to communicate their results.

Audience information (listening/responding routine)

Each audience member writes comments on sticky notes and leaves comments on the poster

- Yellow: Something you liked or learned about the presentation
- 2nd color: One suggestion for improvement or a question that you have about the presentation

Afterwards, the groups discuss the feedback they received (referring to notes)

Video: Auto Safety Posters

(5 minutes)

Higher Stakes: Module Projects

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Formats

- Written report
- Poster board
- PowerPoint presentation

Individual or group

Some in-class presentations (w/video)

Video: PowerPoint Presentation

- Linear and nonlinear regression
(exponential, quadratic, logarithmic)
- 3 to 5 minutes
- Work in pairs or alone
- Students receive the grading rubric in advance

Grading Module Projects

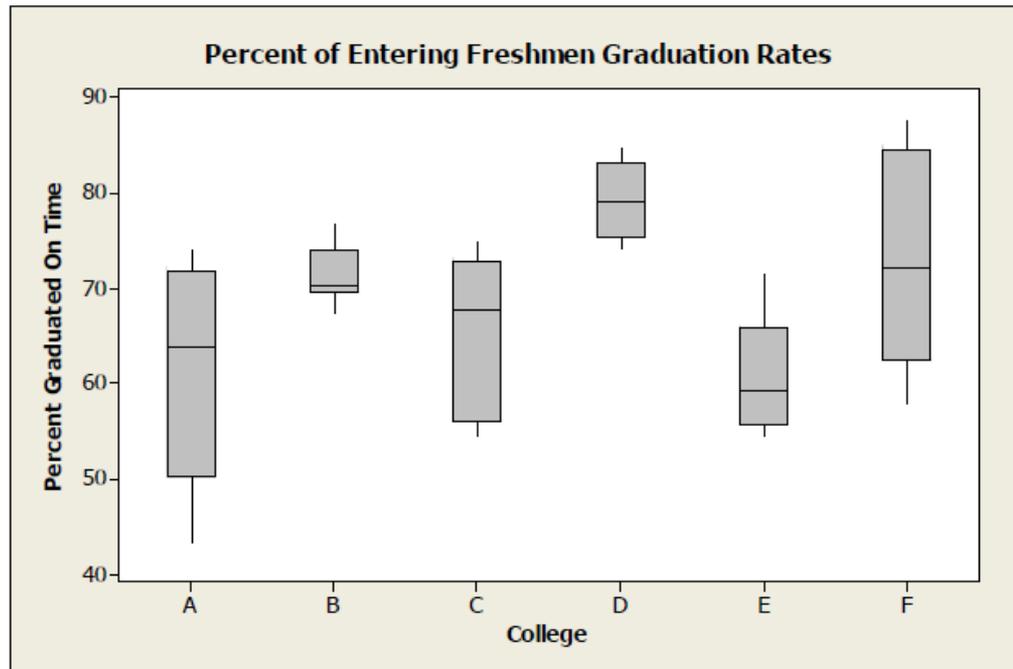
Modules 3 & 4 PowerPoint				
Intro slide				
	Describe data set		2	
	Identify variables w/units		3	
	Why is it important/interesting?		2	
Linear Regression				
	Scatterplot/regression line		1	
	Calculate r, r squared, ADL		3	
	Strength/direction		2	
	Meaning of r, r squared, ADL		3	
	Slope/interpretation		2	
	Y-intercept/interpretation		2	
Exponential Model				
	Scatterplot/regression curve		1	
	ADC		3	
	How well does the curve fit?		2	
	Meaning of ADC		1	
Quadratic Model				

High stakes: Exams

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From the 1st exam

Researchers recorded the percentage of each entering Freshman class that graduated on time for each of six colleges within a major university over a period of several years.



Based on the above data, if you were debating between attending colleges B and F, which one would you choose and why?

High stakes: Exams

From the final exam

A college statistics class conducted a survey of how students spend their money. They asked 25 students to estimate how much money they typically spend each week on fast food. They determined that the mean amount spent on fast food is \$31.52 with a standard deviation of \$21.60. Later, they realized that a value entered as \$3 should have been entered as \$30. They recalculate the mean and standard deviation. The mean is now \$32.60. If the error is corrected, write a detailed explanation of how this affects the standard deviation? Explain your answer using complete sentences.

The standard deviation would decrease. Since a typical student will spend \$32.60 on fast food a week, inserting a value that is so low would increase the SD. Once the error is fixed, the standard deviation will decrease since that new, fixed value is closer to the mean which causes less deviation.



For more information

Accelerating Acceleration

Thursday, June 13 3:10-4:10pm

Composite Room (3rd floor)

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