

Do and Review

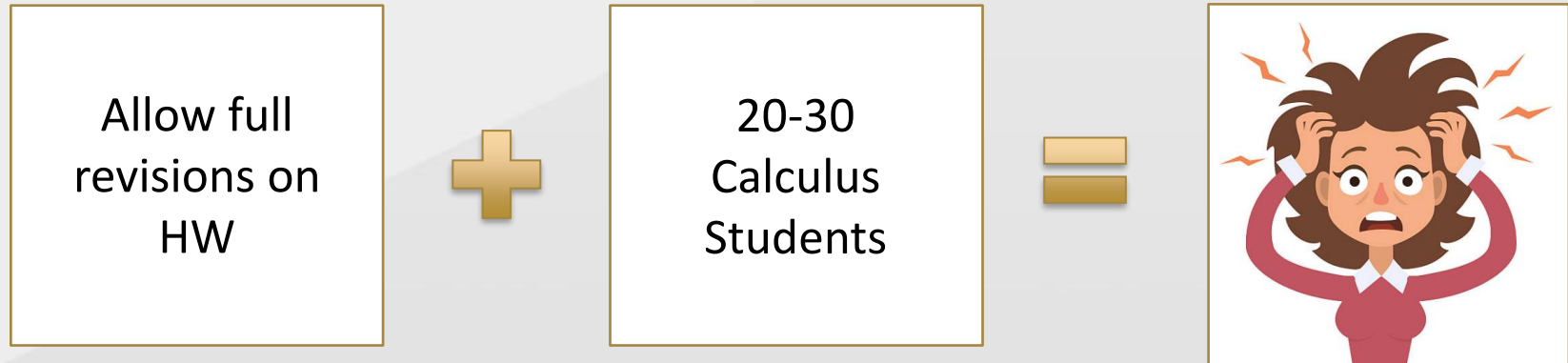
Facilitating Learning Through Self-Assessed
Homework Assignments

Kristen Mazur and Carolyn Yarnall

August 5, 2023

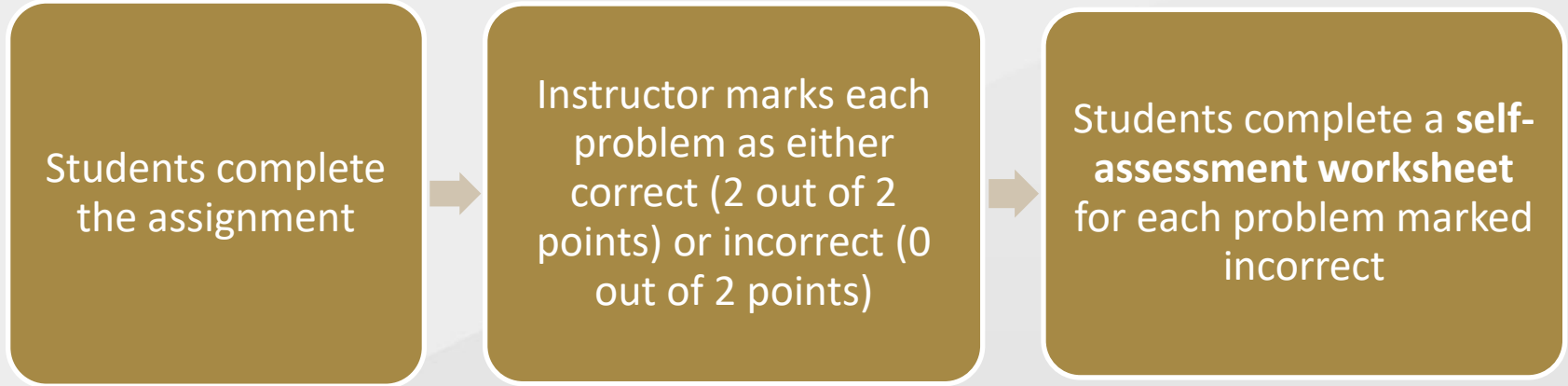
Grading for Equity*

- Clearly defined standards
- Helpful feedback
- Marks indicate progress
- Reattempts without penalty

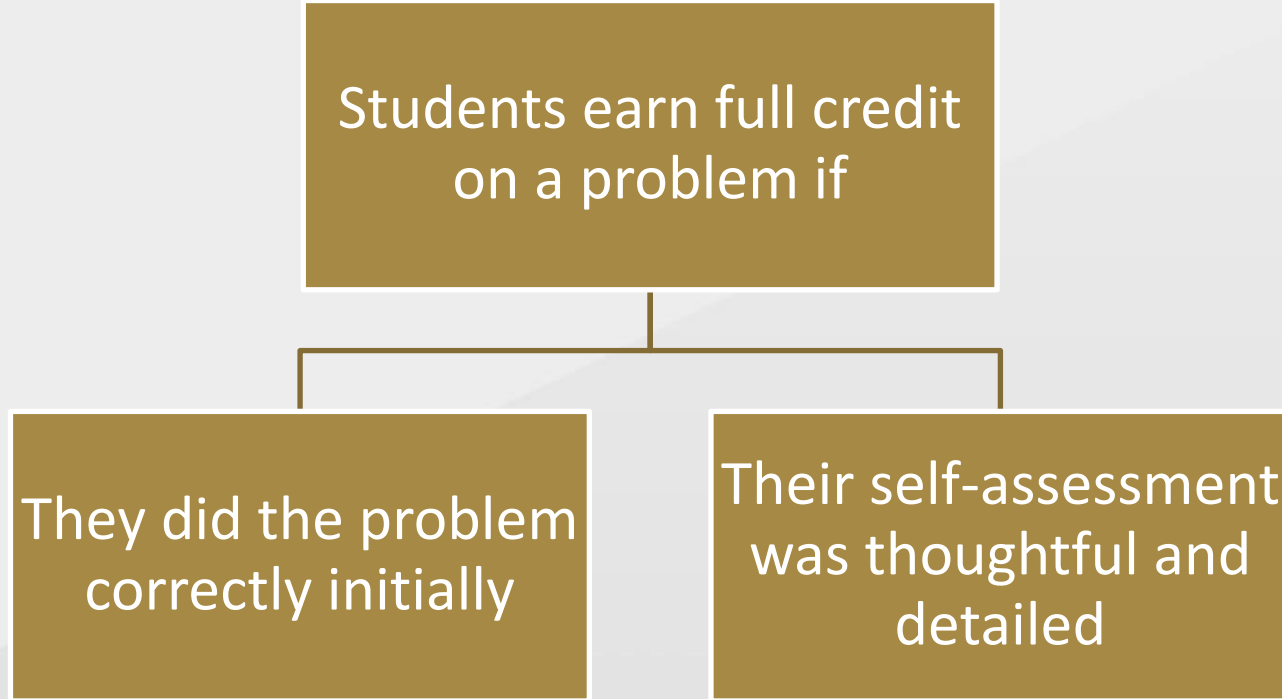


*From the Academy of IBL: <http://www.inquirybasedlearning.org/>

Do and Review System



Do and Review System



Self-Assessment Worksheet

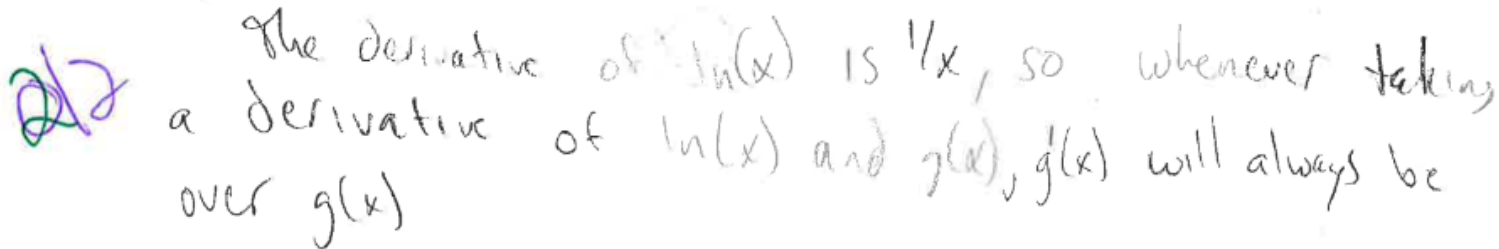


- 1. Compare your solution to the online solution**
 - a. Identify the similarities and differences
 - b. Which of the differences was incorrect/incomplete?

- 2. Classify your mistake**
 - a. Select all that apply from a given list

- 3. Reflect on your learning**
 - a. What did you learn?
 - b. What insights did you gain?
 - c. How has your thinking changed?

Student Solution



Online Solution

(b) Use the Chain Rule in the above box to explain why $\frac{d}{dx}[\ln(g(x))]$ is equal to $\frac{g'(x)}{g(x)}$.

Note: The same rules apply here as in part (a).

Solutions must contain the following components:

- i. Recognition that $\ln(g(x)) = f(g(x))$ where $f(x) = \ln(x)$
- ii. Recognition that $f'(x) = \frac{1}{x}$
- iii. Recognition that $f'(g(x)) = \frac{1}{g(x)}$

Note: $f'(g(x))$ is **not** multiplying f' by $g(x)$. It is function composition.

Sample Solution: The function $\ln(g(x))$ is a composition of functions $f(g(x))$ where the outside function $f(x)$ equals $\ln(x)$. Thus, by the Chain Rule, the derivative of $\ln(g(x))$ is $f'(g(x)) \cdot g'(x)$. Since the derivative of $\ln(g(x))$ is $\frac{1}{x}$, it follows that $f'(g(x)) = \frac{1}{g(x)}$. Hence, the derivative of $\ln(g(x))$ is

$$f'(g(x)) \cdot g'(x) = \frac{1}{g(x)} \cdot g'(x) = \frac{g'(x)}{g(x)}.$$

Self-Assessment Worksheet Example

Part 1: Compare and contrast your solution with the solution online. Carefully read over your solution and the solution online. Then answer the following prompts.

(a) Identify the ways in which your solution is similar to the solution online.

My solution was similar because I recognized that $f'(x)$ is equal to $1/x$.

(b) Identify the ways in which your solution is different from the solution online.

My solution was different because I failed to address that $\ln(g(x))$ is a composition of functions and that $f'(g(x)) = 1/g(x)$.

(c) Among the parts that are different, which are incorrect or incomplete.

My answer was on the right track although it was incomplete due to the components missing above.

Part 2: Classify your mistakes. Identify the type(s) of mistake(s) that you made on this problem. (Select all that apply)

- I misunderstood or misused a definition or concept
- I used ambiguous or imprecise language
- I made a calculation or Mathematica error
- I did not read the problem carefully
- I misunderstood what the question was asking
- My explanation was missing details
- My explanation was focused on procedure instead of concepts
- Other (explain):

Part 3: Reflect on your learning. Provide a brief response to at least one of the following prompts.

- a. What did you learn from attempting and then self-assessing this problem?
- b. What insights (either related to course content or to general learning/college skills) did you gain?
- c. How has your thinking changed since first attempting this problem?

I gained insight that will help me throughout college. I should never leave out details even if they are minuscule because a more thorough explanation could never hurt me.



ELON

Undergraduate teaching focus

Located in Elon, NC

Private Institution

6,302 undergraduates

Residential campus

Most students are 18-22 years old

6% Lat./Hisp., 6% Black, 80% White

CSUDH

CALIFORNIA STATE UNIVERSITY, DOMINGUEZ HILLS

Undergraduate teaching focus

Located in Los Angeles

Public Institution

15,070 undergraduates

95% of students commute

Average age is 25

68% Lat./Hisp., 11% Black, 5% White



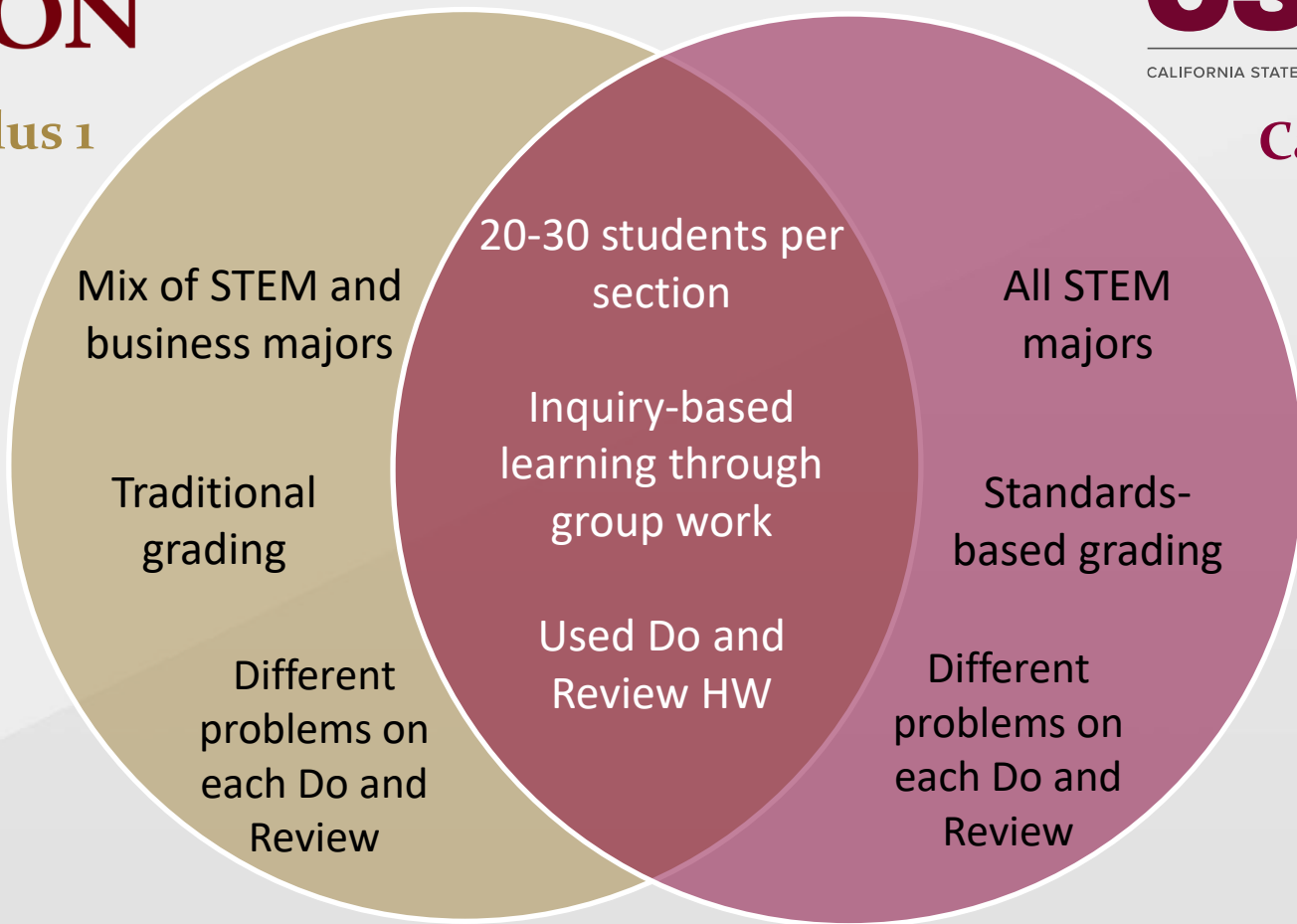
ELON

Calculus 1

CSUDH

CALIFORNIA STATE UNIVERSITY, DOMINGUEZ HILLS

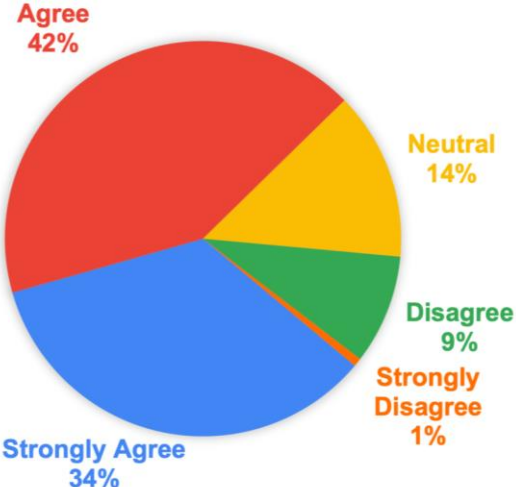
Calculus 1



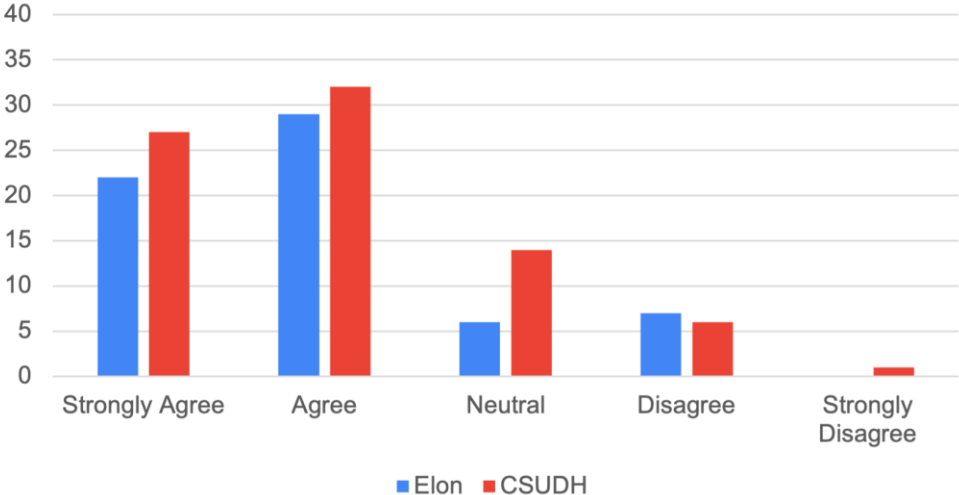
Survey Results



THE D&R HW WAS VALUABLE TO MY LEARNING



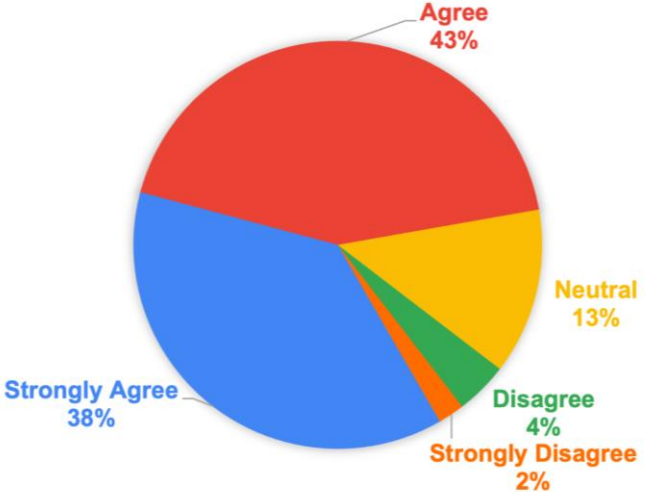
The D&R HW Was Valuable to My Learning



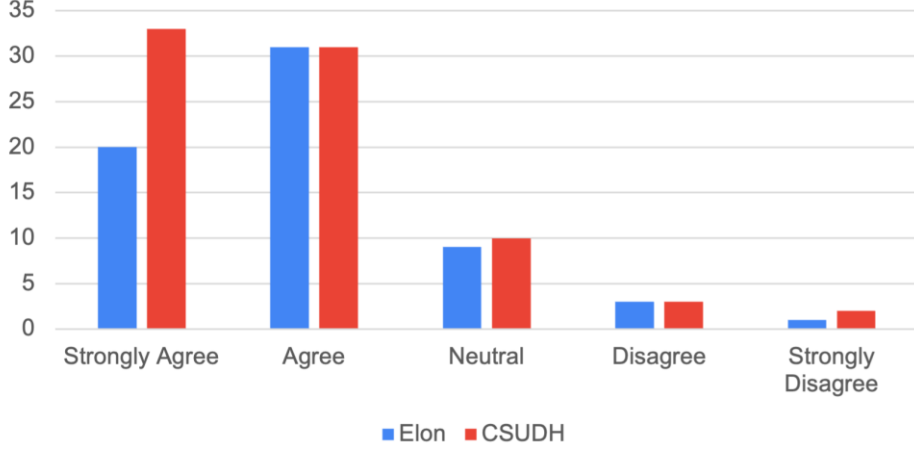
Survey Results



THE D&R HW HELPED ME UNDERSTAND THE VALUE OF MAKING MISTAKES



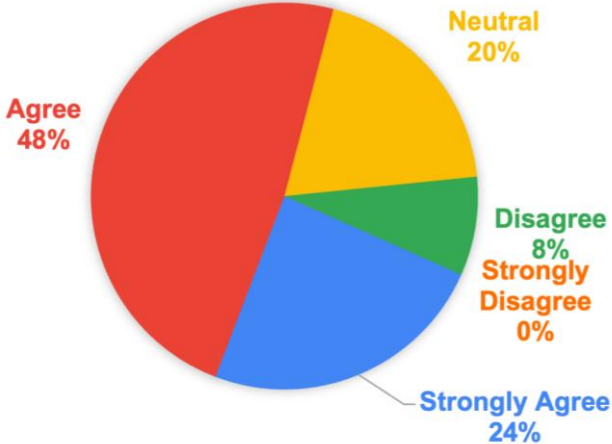
The D&R HW Helped Me Understand the Value of Making Mistakes in the Learning Process



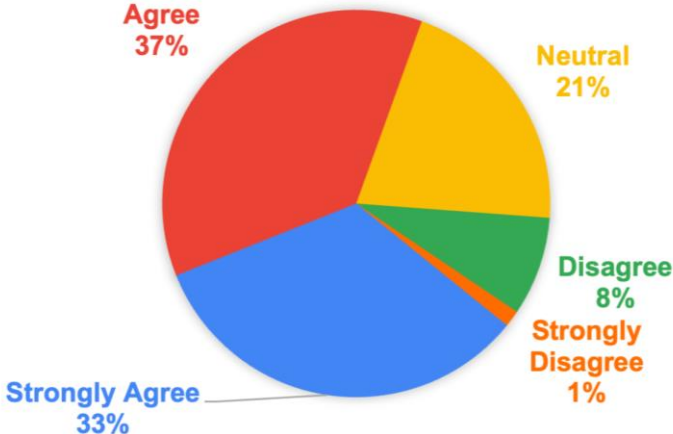
Survey Results



THE "DO" PART WAS MEANINGFUL



THE "REVIEW" PART WAS MEANINGFUL



Themes in what students liked



- Allowed them to learn from their mistakes (32%*)
- They did not stress about making mistakes/an incorrect answer would not hurt their grade (32%)
- It helped them learn course material (16%)
- The problems were challenging (15%)

*"I think that it was a good way to **challenge us with difficult problems but without letting it hinder our grade**. Also, it was a great way to evaluate ones mistake and learn how to get better from them."*

"I liked that the questions challenged me, and I could take part in the learning experience afterwards if I made any mistakes. I love how this whole process is about learning rather than getting one shot at getting credits. This shows that learning is more important than grades."

*Percent of responses that included this theme

Themes in what students did not like



- It took too long (9%*)
- Felt like busy work/Process was too repetitive (9%)
- No partial credit (7%)
- Having to self-assess small mistakes (7%)
- Issues with responding to the self-assessment questions (4%)
- Issues with the problems assigned (not the system) (26%)
- Misc. issues unrelated to problems or the system (10%)

26% of responses said None/Nothing/NA/etc. or were left blank.

*Percent of responses that included this theme

Survey Summary



- Student responses were mostly positive
- Majority of students **from both schools** saw the value of the Do and Review HW

This HW system can be applied to many different courses and to many different student bodies

Would we use Do and Review in future courses?

YES!



ELON

Kristen Mazur – kmazur@elon.edu

YES!

CSUDH

CALIFORNIA STATE UNIVERSITY, DOMINGUEZ HILLS

Carolyn Yarnall – cyarnall@csudh.edu