

Promote Agency and Access with Discussion Routines that Address Linguistic and Mathematical Demands

William Zahner

Ernesto Calleros

Kevin Pelaez

San Diego State University

Agenda

1. Intros
2. Warm-up
3. Motivation and Mathematical Language Routines
 - a. Notice and Wonder
 - b. Collect and Display
 - c. Alternating between small and whole group
4. Sample Task – Download Rates
5. Discussion



Focus Questions

1. How do teachers maintain high expectations for all students' mathematics understanding in heterogeneous classrooms?

- *Use challenging tasks with heterogeneous classes, providing appropriate*

6. How do educators use technology to increase students' access to rigorous and relevant mathematics curriculum and instruction?

- *Model using two Lessons (Same speed walks & Download Rates)*
- **Strategies**
 - Compare rate in multiple representations
 - Stronger and Clearer Routine
- **Ambiguous prompt: no numbers on the axes, press for reasoning**

Intros

Kevin Pelaez



Ernesto Calleros



Objective

To create a learning environment in a linguistically diverse secondary mathematics classroom where students learn to reason about linear rates of change



Design Cycles

Design-based research (Cobb et al., 2003)

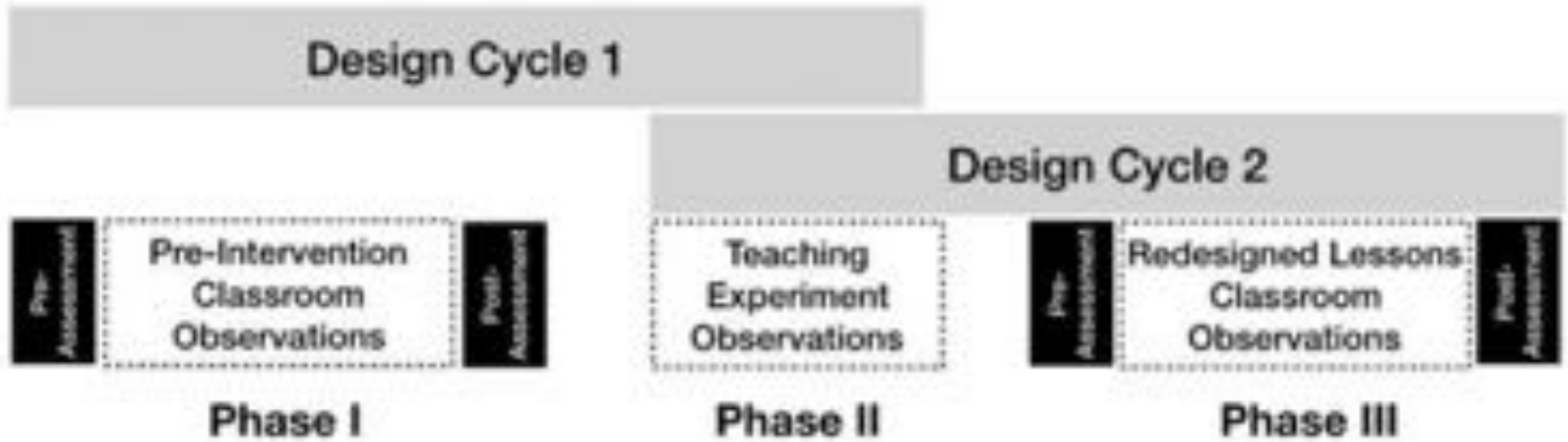


Figure 1: Overall project design and phases of design cycles.

Thank you!
For more information
<https://meld.sdsu.edu>

William Zahner



Kevin Pelaez



Ernesto Calleros



Warm Up

A las seis de la mañana la temperatura estaba -4°F . A las tres de la tarde la temperatura había aumentado 17°F . ¿Cuál fue la temperatura a las tres?



Design Principles

Building on insights from prior design efforts in linguistically diverse mathematics classrooms (Chval et al., 2014; Prediger & Zindel, 2017) and the ALM framework, our redesign efforts were based on three guiding principles:

1. Aligning a conceptual focus and problem contexts across the unit to minimize linguistic complexity

2. Integrating mathematical language goals linked to the conceptual focus

3. Incorporating language supports in daily lesson activities

(Zahner et al., 2021)

Design Principles

1. Read the task

1. Aligning a conceptual focus and problem contexts across the unit to minimize linguistic complexity

2. Integrating mathematical language goals linked to the conceptual focus

3. Incorporating language supports in daily lesson activities

(Zahner et al., 2021)