

# Fostering culturally-responsive, play-based learning as part of California's Statewide Early Math Initiative

Research by the AIMS Center for Math  
and Science

Brittany Caldwell, PhD Candidate, UC Santa Cruz

Meghan Macias, PhD Student, UC Santa Barbara

Leah Rosenbaum, PhD Candidate, UC Berkeley

# Agenda

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## Background

CAEMI Project

AIMS Center for Math and Science Education

## Research Overview

## Case Review

## Audience Participation

Table Discussions (15-20 min)

Whole Group Discussion (~15 min)

# Project: California Early Math Initiative (CAEMI)

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# California Early Mathematics Initiative (CAEMI)

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Goal: Increase access to play-based, culturally-responsive mathematics for CA learners aged 0-8 and improve outcomes.

Process: Unite researchers, practitioners, coaches, and educators to create early childhood mathematics learning plans that involve both professional development and coaching support.

# AIMS Center for Math and Science Education

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# AIMS Background

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**History:** Beginning with an NSF grant in the early 1980s, the AIMS Education Foundation developed meaningful math and science activities and provided training and professional development to educators using these materials.

**Mission:** The AIMS Center explores researched-backed practices for fostering playful, imaginative, creative, human-centered, and socially-informed approaches to teaching and learning mathematics and science, focusing on improving outcomes for learners in California's Central Valley.

# Research Team



Paul Reimer,  
AIMS Center Director



Jim Gribble,  
AIMS Fellow (UCSB)



Meghan Macias, AIMS Fellow  
(UCSB)



Alexis Spina,  
AIMS Fellow (UCSB)



Leah Rosenbaum,  
AIMS Fellow (UCB)



Brittany Caldwell  
AMIS Fellow (UCSC)

# Research Overview

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# Who's who: A Multi-Tiered Approach

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- AIMS Coaches: Professional learning experts that worked together to lead the summer 2019 PD institute and provide year-round coaching.
- Research Fellows: Graduate students who collaborated with AIMS Coaches but are also paired with a group of PLFs from one organization.
- Professional Learning Facilitators (PLFs): Teachers, directors, practitioners, and early care providers that attended the summer 2019 institute. PLF's are receiving coaching from the AIMS coaches as well as giving training to ECE's.
- Early Childhood Educators (ECEs): Teachers, early care providers, and parents from the PLFs respective communities. ECEs will receive training from PLFs.

1. Summer 2019 PD Institute - Fresno, CA

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100+ PLFs from 30+ organizations  
5 AIMS Coaches  
5 Research Fellows

2a. Year 2019/2020 Coaching Received from AIMS

PLF Organization, AIMS coach, Research Fellow

PLF Organization, AIMS coach, Research Fellow

PLF Organization, AIMS coach, Research Fellow

PLF Organization, AIMS coach, Research Fellow

2b. Year 2019/2020 Coaching Given to ECE's

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Early Childhood Educators (ECEs) in the community

3. Summer 2020 Institute - Fresno, CA

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# Cases

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# Focal Cases

	<b>Apple Orchard</b>	<b>Blackberry Patch</b>	<b>Strawberry Field</b>	<b>Orange Blossom County Office of Education</b>
<b>Organization Type</b>	Resource and referral agency	Preschool teachers + Resource and referral agency	Resource and referral agency	County office of education
<b>Team Composition</b>	4 PLFs with combined decades of experience	3 PLFs with experience working together	3 PLFs from the same resource & referral agency	3 PLFs from the same county office of education
<b>Goals</b>	Use a PBL model to instill playful attitudes about mathematics	Hands-on/minds-on learning connected to cultural funds of knowledge	Educate ECEs about play-based mathematics learning	Play-based learning and the importance of early math

# Audience Review

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# Review and Discussion Questions

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1. What do you see as key elements (expertise, resources, contextual factors) that will contribute to this plan's success? What do you anticipate might be major challenges?
2. Which elements, if any, could you envision implementing in your work?
3. Have you addressed similar concerns in your own context? If so, how?
4. Do particular research questions, frameworks, or additional resources come to mind to inform this project?

## Key Elements

### Success:

- + Team of people w/ different roles (not just one person)
- + One-on-one coaching sessions
- + High quality text choices (e.g. Helm & Katz's (2016) Young Investigators)

### Challenges:

- Order and quantity of concepts covered in the learning events.
- Ambitious goals: how do you make material digestible for ECEs?
- Implementation challenges around time and motivation, especially with educator schedules.
- How comfortable are the PLF's with adult learners?
- Is teaching culturally relevant math "too much" for teachers?

## Elements Transferrable to Your Work

- Having a more experienced teacher sit with a less experienced teacher while watching an experienced teacher to help with highlighting what's important in the interaction they're observing
- Importance of making sure that the PLF's and ECE's struggle through concepts the way their students might (visualizing individual students and building empathy.)
- In order to address resources concern, consider Zeno: Make games and also provide instructions on how to teach the game

## Research Questions or Frameworks?

- Adult learning theory (teaching adults different from teaching children)
- Play looks different between different ages → "Serious Fun" (NAEYC) provides resources on what play might look like for older children such as a 9 y/o



# THANK YOU!

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For more information, visit: [aimscenter.org/caemi](https://aimscenter.org/caemi)

Or contact us:

Brittany Caldwell - [bbettner@ucsc.edu](mailto:bbettner@ucsc.edu)

Meghan Macias - [meghanmacias@ucsb.edu](mailto:meghanmacias@ucsb.edu)

Leah Rosenbaum - [lehr@berkeley.edu](mailto:lehr@berkeley.edu)



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# Frameworks (opt)

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Constructivist rather than didactic approaches to learning

Communities of Practice/Communities of Learners (Lave & Wenger, 1981)

Desimone's (2009) for studying professional development:

