Innovations in STEM Teaching and Teacher Training and Development

Moderated by:
Dr. Frank A. Gomez
Executive Director, STEM-NET
Office of the Chancellor

https://www2.calstate.edu/impact-of-the-csu/research/stem-net

The California State University
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Innovations in STEM Teaching and Teacher Training and Development

Speakers

Michele Korb, CSU East Bay
Aligning the Science Teacher Education Pathway: A Networked Improvement Community

Hao Yue, San Francisco State
CS4SF: A Scalable Model for Preparing High School Teachers to Provide Rigorous, Inclusive Computer Science Instruction

Kathryn Hayes, CSU East Bay
Equitable Elementary Science Education: Tools for Teacher and District Capacity Building

Ben Ford, Sonoma State
Making Math: Building Authentic Math from Maker Experiences in Upper Elementary Grades

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A·STEP Aligning the Science Teacher Education Pathway

Aligning the Science Teacher Education Pathway: A Networked Improvement Community

Dr. Michele Korb, Professor, Cal State East Bay
Dr. Michelle Sinapuelas, Project Director, Cal State East Bay

This work is supported by grants from the National Science Foundation, A-STEP Project DRL-1908900 ASET Project DRL-1418440. PI: michele.korb@csueastbay.edu

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A·STEP
Aligning the Science Teacher Education Pathway

Project Overview

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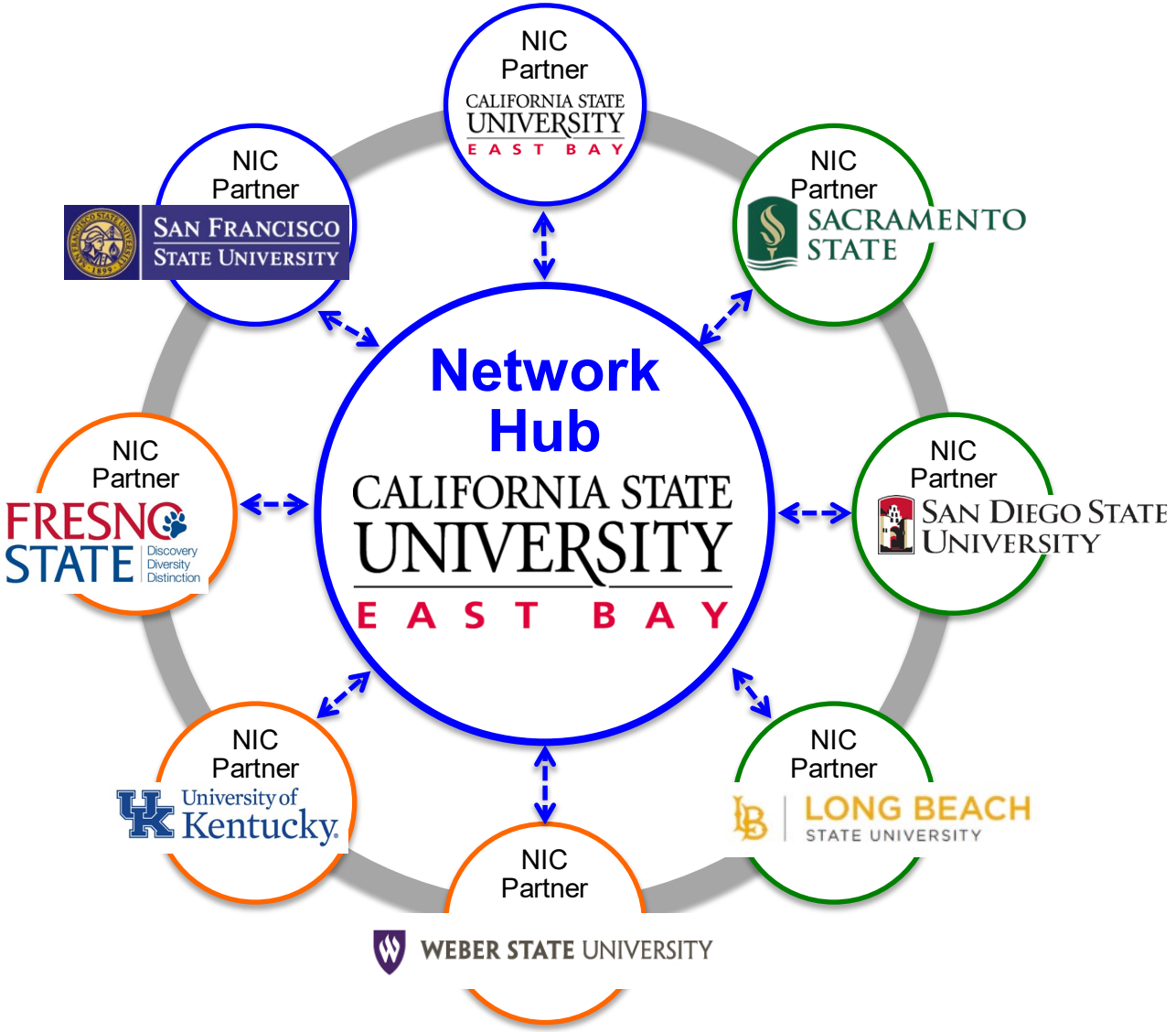
A·STEP
Aligning the Science Teacher Education Pathway

Step 1: Science Teaching Methods Courses

Step 2: Fieldwork Experiences

Step 3: Induction

Step 4: District Professional Development



The A-STEP Project Focuses on Alignment Across 4 Key Steps of the Science Teacher Education Pathway

A-STEP
Aligning the Science Teacher Education Pathway

STEP 1: UNIVERSITY SCIENCE TEACHING METHODS COURSES

The ASET Toolkit is used to foster discussions in the science methods courses of how to design and enact NGSS aligned lessons

STEP 2: CREDENTIAL CANDIDATE FIELDWORK EXPERIENCES

Collaborate with university supervisors and cooperating teachers to implement use of the ASET Toolkit to better align classroom instruction with the goals of NGSS and to facilitate post observation discussions around this alignment

STEP 3: INDUCTION PROGRAMS

Collaborate with district level induction programs and training within the first 3 years of entry into the profession to include use of the ASET Toolkit to bridge the lessons from these credential programs into these district level trainings

STEP 4: DISTRICT PROFESSIONAL DEVELOPMENT

Collaborate with local school districts to implement use of the ASET Toolkit as part of the existing professional development (PD) efforts for inservice science teachers

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A·STEP
Aligning the Science Teacher Education Pathway

Project Activities & Goals

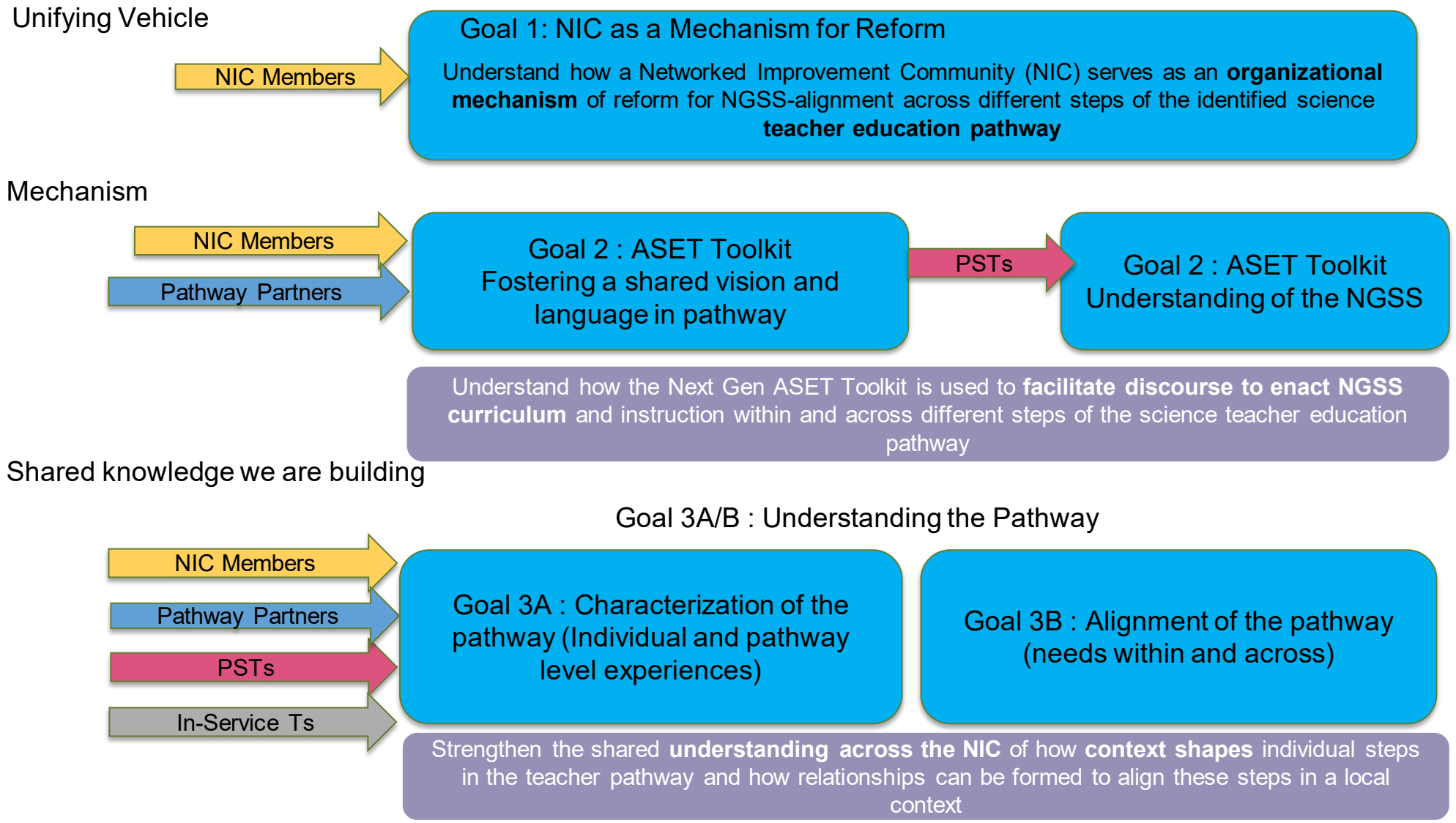
A-STEP Goals

1. Understand how a Networked Improvement Community (NIC) serves as an **organizational mechanism** of reform for NGSS-alignment across different steps of the identified science **teacher education pathway**

2. Understand how the Next Gen ASET Toolkit is used to **facilitate discourse to enact NGSS curriculum** and instruction within and across different steps of the science teacher education pathway

3. Strengthen the shared **understanding across the NIC** of how **context shapes** individual steps in the teacher pathway and how relationships can be formed to align these steps in a local context

A-STEP Project Goals – a visual



Monthly NIC Meetings

Month	Topic	Type
August	Review of plans for Year 3 and IRB updates	Planning
September	Presentation by Dan Bedford: Teaching Climate Science	Guest Speaker
October	Phenomenon & Thinking about big picture goals from this research	Sharing Ideas/Planning
November	Presentation from Weber State: Secondary PD Model	Sharing Pathway Work
December	Spring Plans and Coherence Survey Timing	Planning
January	Sharing from NIC hub of Fall SIPs Data	Data share from hub
February	Guest Peter A'Hearn - President, California Association of Science Educators (CASE)	Guest Speaker
March	Phenomenon Tool: Feedback on Improvements	Sharing Tool Development
April	Roundtable Paper Share	Sharing Research Progress
May	Pathway partner meeting to share current work and challenges	Sharing Ideas/Guests
May	Yearly NIC gathering, 2-day in-person/virtual event	Sharing Ideas/Data share from hub

NIC Member Activities

- **STE:** Nelson, F. P., Kerstiens, G., Sinapuelas, M., & Lardy, C. (October 2021). *Supporting social justice in science education: Ensuring equal access to quality standards-aligned education through a networked improvement community.* Paper presented virtually at the 2nd International Conference on Science and Technology Education, Porto, Portugal.

- **CASE:** Lardy, C., Ross, D. and Vaughn, M. (January 2022). Using a Toolkit to Support Coherence in Supervising Secondary Science Student Teachers. Paper presented virtually at The Association for Science Teacher Education (ASTE) Annual International Conference

KSTA:

- Xiang, L. (February 2022). Planning Phenomenon-based Three-dimensional Teaching with the ASET 3D Map. Presented in the 2022 KSTA Virtual Conference.

- Xiang, L. (February 2022). Is It a Good Anchoring Phenomenon? Presented in the 2022 KSTA Virtual Conference.

- **KY Science Teaching Summit:** Xiang, L. (February 2022). Using a 3D mapping tool to help pre-service and in-service teachers planning NGSS-aligned lessons. Presented in 24th Higher Ed KY Science Teaching Summit.

- **AERA:** Sinapuelas, M., Huang, H-J., Nelson, J., and Kerstiens. (April 2022). What Learning Objectives Generated by Preservice Teachers Suggests About NGSS Lesson Multi-Dimensionality. Paper presented virtually at American Education Research Association (AERA) Annual Meeting

NIC member activities…

- **August 2022 –** Biennial Conference on Chemical Education
  - Claesgens, J., Sinapuelas, M., Stacy, A. (August 2022). Mapping your way through the Next Generation Science Standards, Workshop presented at the Biennial Conference on Chemical Education, West Lafayette, IN

- **October 2022 –** California Science Education Conference
  - Several members have submitted work on how to support new and existing teachers with implementing the NGSS via created curriculum samples or existing curriculum

See our website for many more activities

Preservice Activities

Continued Implementation of ASET Toolkit in Methods Courses

- Elementary Methods Courses: 17 Courses across 6 Universities (456 PSTs enrolled)
- Secondary Methods Courses: 6 Courses across 5 Universities (89 PSTs enrolled)

In total we implemented the tools with
545 Pre-Service Teacher's enrolled in
science teaching methods courses
Across 8 Universities!

Extended Activities

Implemented the ASET Toolkit in some new courses:

Weber State used them in a course with 11 undergraduate science majors

The STAR program implemented them in their summer seminar as part of the research experience with 15 Pre-Service Teachers and 8 In-Service Teachers

**We sadly lost our induction partner this year, so we are retooling for our last grant year.*

Pathway Activities

Continued Implementation of ASET Toolkit in other Pathway Steps

University Supervisors: ASET Tools were integrated into the university supervisor meetings at San Diego State & Sacramento State

Hosted training and professional development sessions:

- PSTs (INDUCTION PATHWAY)
  - Workshop for Trellis scholars and mentor training day (Trellis: CSUEB & SFSU)
- ISTs
  - Held week-long summer PD for secondary teachers and then continued with Fall graduate course meeting during Fall ‘21 (Weber)
  - Series of 4 NGSS workshops with local school district (Fresno)
  - Series of 4 NGSS workshops with Norwalk La Mirada School Teachers (CSULB)
  - PD as part of PIMSER program (UKY)

May Pathway Meeting Participants

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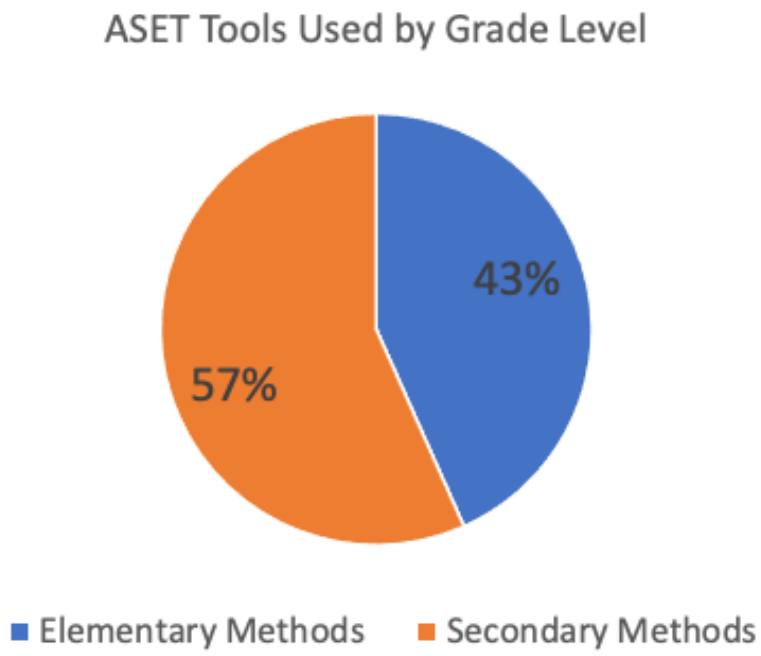
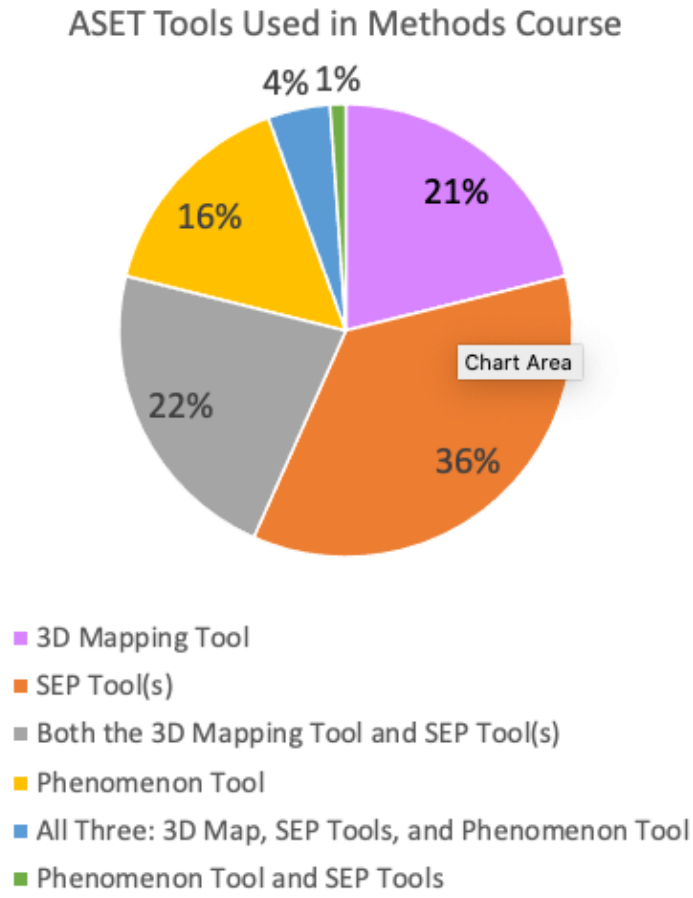
Some results (there are so many)
And Lessons Learned

Methods Path

Snapshot of Implementation in our Methods Courses

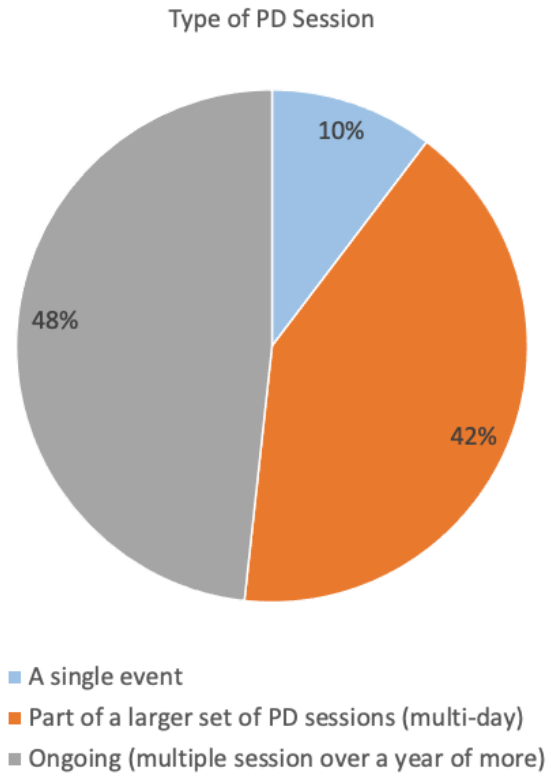


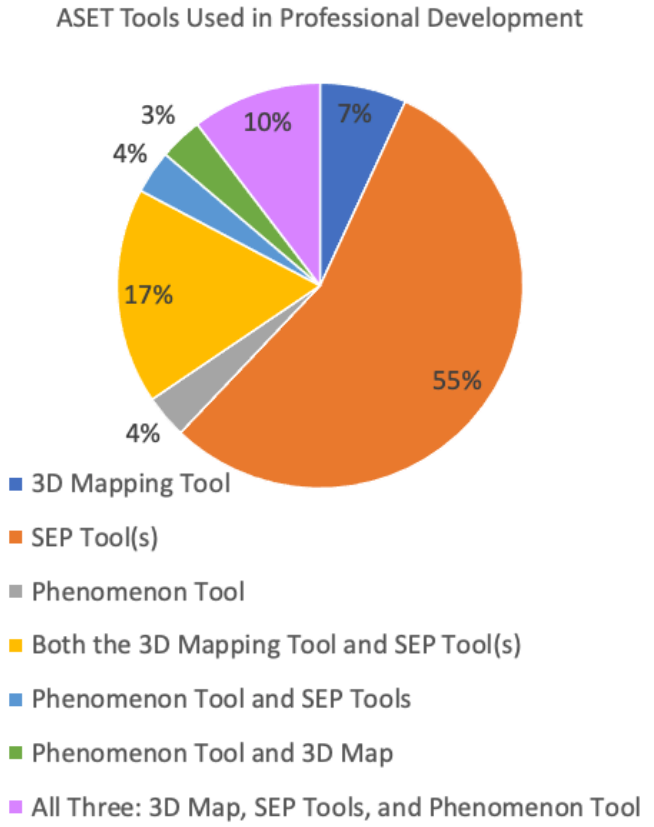


PD Path

Snapshot of Implementation in Professional Development

29 Responses: CSU Long Beach, Univ of Kentucky, Trellis, Weber





Science Instructional Practices (SIPS) Data Samples (K. Hayes, et al, 2016)

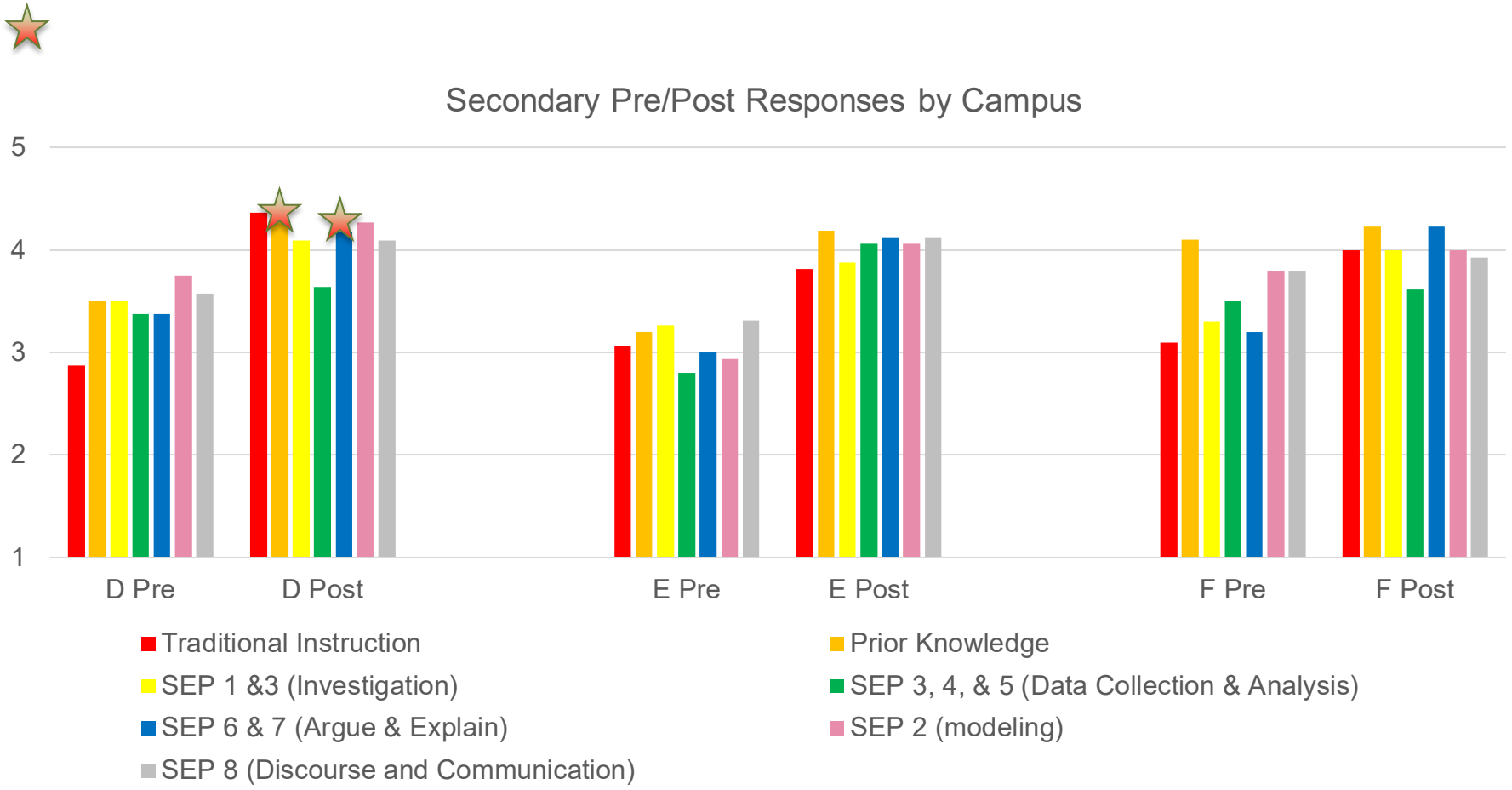
Measuring engagement in Science and Engineering Practices

	Pre	Post
All Responses	299	229
Elementary	245	179
Secondary	54	50

Fall 2021 SIPS Data

Secondary Responses by Campus

One-sided t-test shows most pre/post pair <0.05
One-sided t-test shows Campus pre/post pair >0.05



Coherence Survey

Esther T. Canrinus, Ole Kristian Bergem, Kirsti Klette & Karen Hammerness (2017)

Elementary Responses, N=76
Campus C: Fieldwork, 9 Responses
Campus E: Induction, 67 Responses

I had at least one opportunity to teach a science lesson during my fieldwork experience

	Campus C	Campus E
Yes	100%	91%
No	0%	9%

Were the science lessons you observed during your fieldwork experience aligned with the expectations of the NGSS?

	Campus C	Campus E
Yes	89%	66.7%
No	11%	13.6%
Didn't observe any science lesson	0%	19.7%

Coherence Survey

Were the lessons you observed during your fieldwork experience aligned with the expectations of the current state standards in your content area (Common Core, NGSS, etc.)?

Secondary Science Responses, N(science)=40
Campus A: Fieldwork, 4 Responses
Campus B: Fieldwork, 13 Responses
Campus D: Induction, 11 Responses
Campus E: Induction, 12 Responses

	Campus A	Campus B	Campus D	Campus E
Yes	100%	85%	73%	73%
No	0%	15%	27%	27%

Secondary General Responses, N(non-science)=51
Campus A: Fieldwork, 8 Responses
Campus D: Induction, 7 Responses
Campus E: Induction, 36 Responses

	Campus A	Campus D	Campus E
Yes	87.5%	86%	97%
No	12.5%	14%	3%

Meetings with Partners

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Elementary

- Difficult to find teachers teaching science in Elementary for pre-service teachers to observe
- Elementary have hired STEM teacher and classroom teachers have "handed off" science teaching to them
- Many have switched to Mystery Science (curriculum) and has seen more teachers teaching science with it on a digital format.
- Include supervisors in the training more often
- Compensate teachers and mentors

Secondary

- Making headway in NGSS has been difficult in general.
- revert to comfort zone (lecture) - protecting their practice.
- Burnout is pervasive. More so this year than any other year.

Partner Feedback

What change they would like to see:

National patterns is to spend more time in math and ELA. **How do we engage school leadership to foster a different culture of learning and approaching science.**

Administration and principals are so important in this process. They can move the needle at their school sites. **How do we engage leadership in this process?**

How do we discuss assessment? This drives teaching

Need to create Institutional continuity - Supervisors have an "in-between role" around supporting teachers. Majority of science teachers don't use NGSS as much as they need to - providing support for PSTs and CTs is a huge challenge.

Next steps & Long-Term Plans

- Videos for mentor and supervisor training
- Release “Phenomenon tool”
- Integrate partner feedback into next project
- Increase focus on supporting current NGSS curriculum
- “Dig into” coherence results
- Publications and presentation
- Collaborations
  - Nationally
  - State-wide (California Association of Science Educators): preservice support/ board representation for IHE
- Next NSF project!!

Thank You


NSF


next gen
ASET
Alliance for Science Educators Toolkit


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UNIVERSITY
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SAN FRANCISCO STATE UNIVERSITY
1899
SF STATE


SACRAMENTO
STATE


SAN DIEGO STATE
UNIVERSITY


FRESNO
STATE
Discovery
Diversity
Distinction


University of
Kentucky


WEBER STATE
UNIVERSITY


LONG BEACH
STATE UNIVERSITY


Institute for
STEM Education
a program of California State University East Bay

CALIFORNIA STATE UNIVERSITY EAST BAY

A-STEP Aligning the Science Teacher Education Pathway

Questions ?

Contact us!

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Visit our website! https://www.nextgenaset.org

CS4SF: A Scalable Model for Preparing High School Teachers to Provide Rigorous, Inclusive Computer Science Instruction

Hao Yue – San Francisco State University

Collaborators: Brian Beatty, Ilmi Yoon, Jingyi Wang, and Patricia Donohue

This project is supported by the National Science Foundation under No.1837699 and 1837552.

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CS4SF: A Scalable Model for Preparing High School Teachers to Provide Rigorous, Inclusive Computer Science Instruction

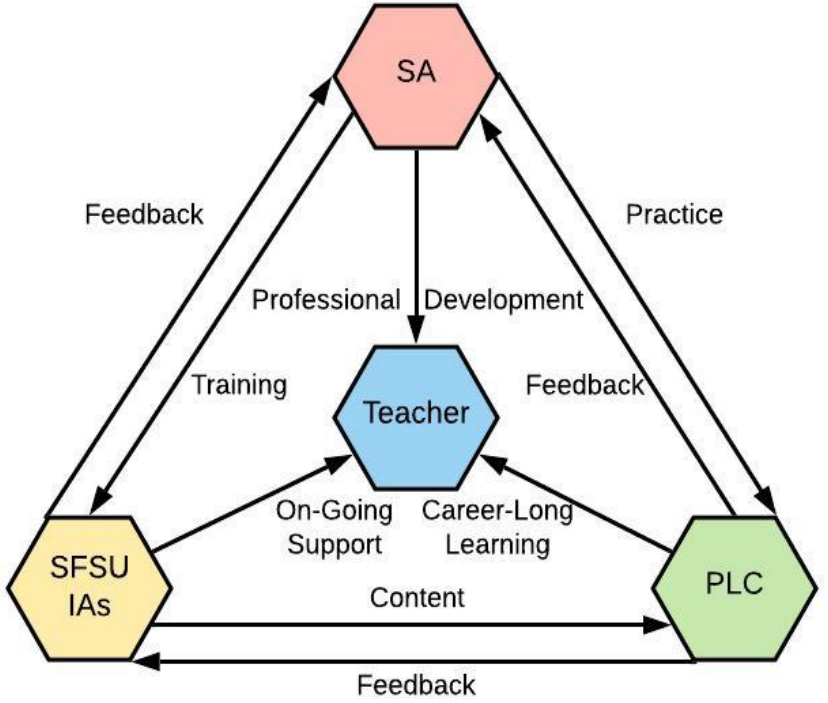
Project Overview

- Providing **CS education** for **K-12 students** is now a national priority
- High school teachers need better preparation and support regarding **CS content knowledge and pedagogical knowledge and practices** to provide inclusive instruction for diverse student populations
- CS4SF is a design-based implementation research-practitioner partnership (RPP) to create and validate a transferable, scalable model for preparing and supporting high school CS teachers

CS4SF: A Scalable Model for Preparing High School Teachers to Provide Rigorous, Inclusive Computer Science Instruction

Activities

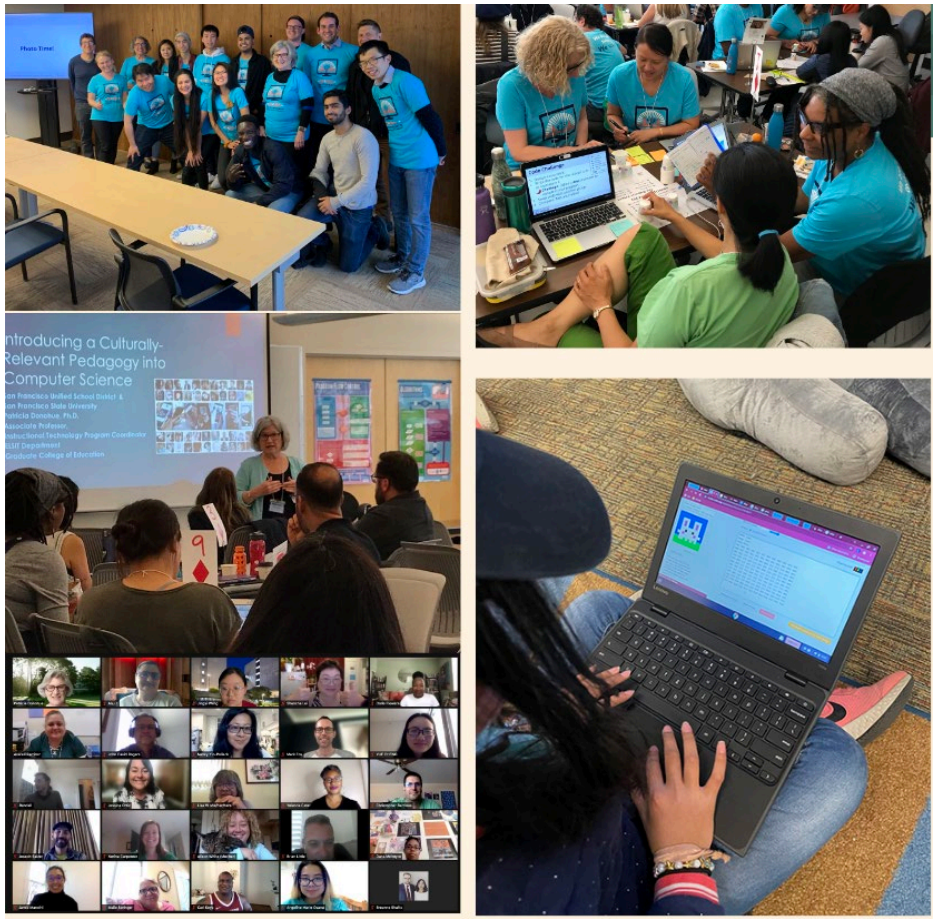
- Create and offer new **CS supplementary authorization program (SA)** to increase authorized high school CS teachers in California
- Establish an **Instructional Assistant (IA) Program** to provide in-classroom support for high school CS teachers and students
- Create **Professional Learning Community (PLC)** for high school CS teachers that provides continuous professional learning on CS curricula and inclusive pedagogical strategies



CS4SF: A Scalable Model for Preparing High School Teachers to Provide Rigorous, Inclusive Computer Science Instruction

Results

- **103 teachers (61% women, 36% from URGs)** have enrolled in the CS SA program. 53 have completed it, and 25 have received their authorization from the state.
- Trained **100+ Instructional Assistants (55% female and 50% URGs)** who provided **7000+** hours of classroom support
- PLC meet monthly and is regularly attended by 20+ SFUSD full-time high school CS teachers. On average, **95%** reported the meetings were useful.
- Impacted and supported **5000+** high school students



Lessons Learned

- K-12 CS teacher training and development research needs an **interdisciplinary team**
- **Start small. Build and run a pilot program first.**
- **Hear the school districts' need**
- Teachers love in-person meetings for short-term PD, but prefer **online format** for long-term PD
- **Financial support** (tuition waiver, stipend, etc.) are critical for some teachers to join the PD

Next Steps/Long-Term Plans

- Collaborate with other CSUs and school districts to scale this effective, evidence-based model to other areas in California
- Adapt this model to prepare and support K-8 CS teachers

Summary

- Introduce our NSF-funded project on **Preparing High School CS Teachers to Provide Rigorous, Inclusive CS Instruction** through effective activities such as CS supplementary authorization program, Instructional Assistant program, and Professional Learning Community.
- We have a dream that all the children will one day live in a nation where they all have opportunity to participate and learn CS in their schools

Questions?

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Equitable Elementary Science Education:
Tools for Teacher and District Capacity Building

Dr. Kathryn Hayes, PI
CSU East Bay

Grant: Science Communities of Practice Partnership (SCOPP)

These materials were developed by project staff as part of the NSF Discovery Research K12 (DRK12) Science Communities of Partnership Project (SCOPP). Award Number:1813012;

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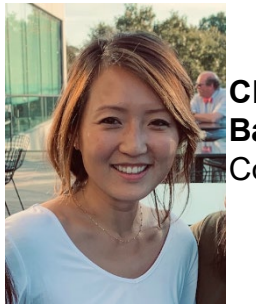
Science Partnership

Equitable Elementary Science Education: Tools for Teacher and District Capacity Building

Our Research and Support Team

Kathryn Hayes, PI



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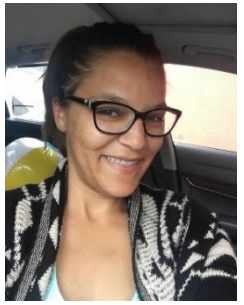

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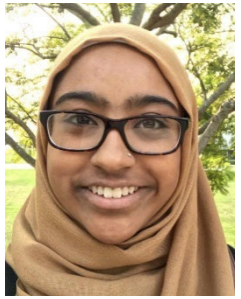

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Undergrad Researcher

Jessica Gladstone
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Equitable Elementary Science Education:
Tools for Teacher and District Capacity Building

Thanks always to our teachers

Project Overview

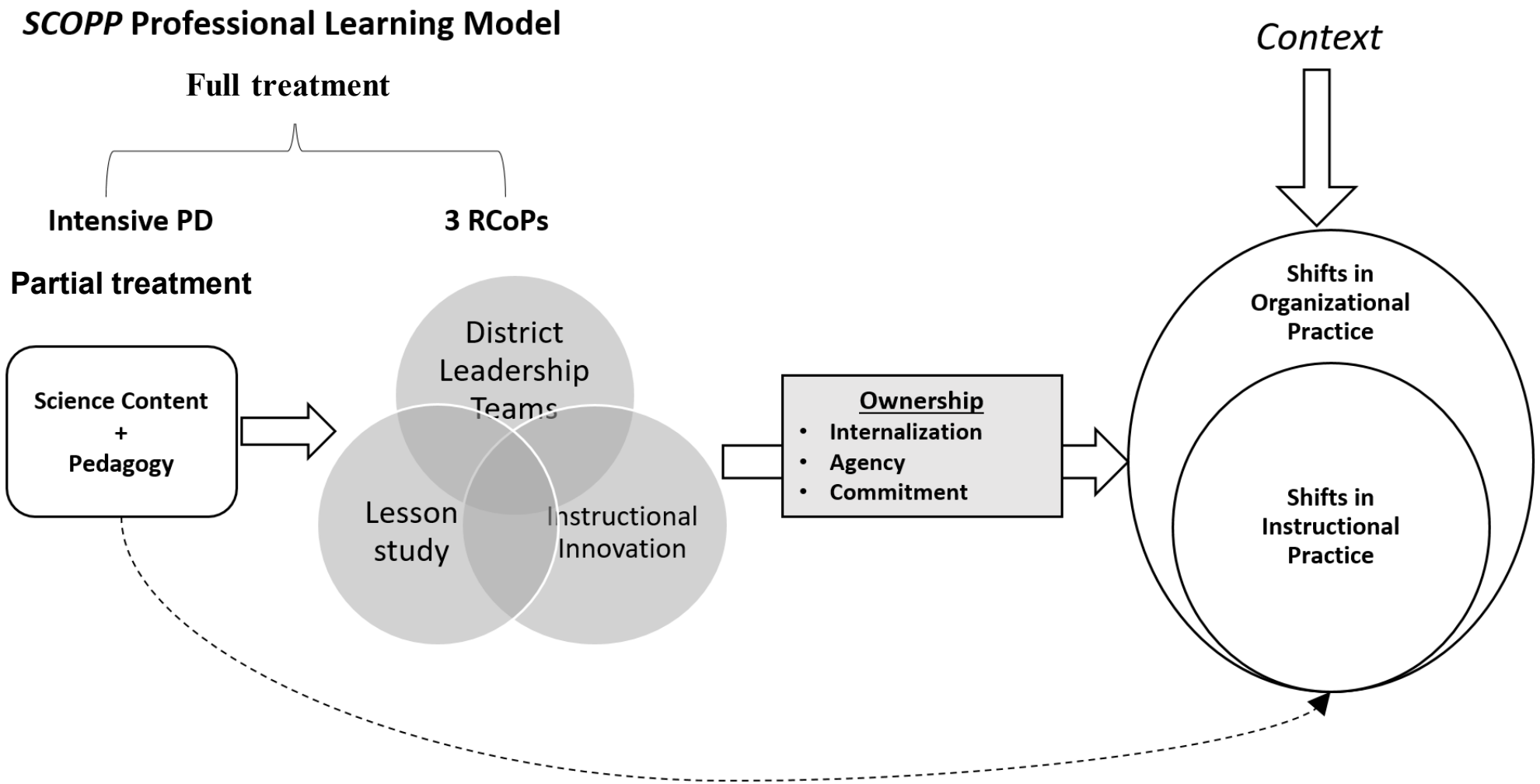
NGSS Requires Shifting the Learners Experience

Teacher sharing their knowledge

Students engaged in equitable sense-making

“Learning About” vs. “Figuring Out”

Theory of Change



Tools for Teacher and District Capacity Building

How do we facilitate meaningful and sustainable improvement in science instruction while simultaneously building capacity within districts to support such instructional change?

Asset-based Student Work Analysis Protocol

- Purpose: Shift teacher analysis of student work from a numerical evaluation to understanding how students conceptualize science phenomena, and the assets and experiences they use. It can be used during a process such as lesson study.
- Research:
  - Completed three rounds of design research, resulting in revisions to the protocol and theory development.
  - Presented at STEM, CSTA and NSTA.

Asset-based Student Work Analysis Protocol

1. Describe lesson goals (5 minutes) *Whole group*

- Presenting teacher (teacher whose student work samples you will be reviewing) describes context and goals:
  - Share the lesson goal. This will form the lens for evaluating this student work.
  - Describe which portion of the work samples should be evaluated against the lesson goal. For example, you may choose to evaluate only one section of a writing assignment or one question on a worksheet.

Grade Level:	
Topic of Lesson:	
Goal being evaluated:	
Section of student work to be evaluated:	

With facilitation, teachers:

1. Discuss the learning goals of the lesson; based on these goals, they decide a portion of the work sample to be evaluated
2. Review student work samples, describing how students are making sense of the concepts and processes of the task, as well as the knowledge and experiences students are drawing on
3. Share and discuss emergent patterns in student understanding
4. Use individual work samples to demonstrate how and why a particular student might conceptualize science ideas
5. Reflect on needed instruction and feedback and revisions to the assignment or lesson

Asset-based Student Work Analysis Protocol Findings

- Teachers tended to focus more on student conceptualization of science ideas when using the protocol
- The protocol yielded an asset-based conceptualization
    - Less sorting, labeling, students, and more connecting with students empathetically
- Allowed teachers to revise their instructional practice to further support student learning

Instructional Innovator Continuums

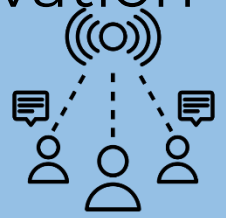
- Purpose: Development of administrator understanding of instructional shifts needed for equitable NGSS-based science instruction, and building capacity to support such shifts
- Research:
  - Four rounds of development and expert feedback completed
  - Instructional Innovator's Toolkit includes 1) pre-observation plan, 2) Observation Continuums for Discourse and Sensemaking, and 3) post-observation debrief
  - Presented at CSTA

Instructional Innovator Continuum Protocol

Pre Meeting with the teacher to get context of learning experience and teachers goals

Facilitated **observation** of learning followed by application of the instructional innovator continuums

Leaders at all levels of the system **debrief** the observation and develop next steps for building capacity



Component 1: Equitable Discourse
Who is ***initiating*** the conversation? Who has ***authority*** in the conversation? ***How many students*** are participating? What ***knowledges and experiences*** are being valued? Do students ***have choice*** in how they participate in discourse?

NGSS Implementation: Novice	**NGSS Implementation: Emerging**	**NGSS Implementation: Experienced**	**NGSS Implementation: Expert**
Discourse opportunities are directed by the teacher. • Few students engaging in whole-class discussions. Everyday experiences and vocabulary are not brought into the scientific discourse. Scientific vocabulary is frontloaded	Discourse opportunities are mostly directed by the teacher. • Teacher initiates whole group and partner discussions with protocols to ensure equity of voice (e.g. equity sticks) Teacher permits students to use everyday language to explain science concepts, but prioritizes academic language.	Diverse discourse opportunities are evident. • Teacher intervenes frequently to reinforce norms, and ensure equity of voice • Students are encouraged to build off each other's ideas Teacher and students are beginning to integrate everyday language with scientific language Teacher elevates traditionally marginalized student ideas during class discourse.	Equitable discourse culture is well established • Teacher makes shifts to original plan to follow through with student ideas/contributions Teacher and students use home, everyday, and academic language fluently during scientific discourse. Teacher and students elevate and value diverse and historically marginalized student ideas during discourse.

Instructional Innovator Continuum Protocol Findings

- Administrators see a new approach to instruction, and discuss shifting their evaluation practices
- Administrators discuss how to support all teachers in making these shifts
- Science becomes centered

Next Steps

Papers			Data Collection				Analysis				Draft Writing				Final Writing			
Motivation																		
Supporting teachers' intrinsic motivation in PD		Brit																
How PD supports teachers' motivation during a pandemic		Brit																
Internalization																		
The processes that shape teacher learning in context		Kathryn																
The role of noticing in teacher science learning		Linda																
Teacher navigation of the organizational context during PD		Kathryn																
Teacher change and multilingual learners		Sarah A																
PD lit review																		
Role of organizational context in teacher professional development		Kathryn																
Discourse																		
Student sense making and agency in teacher-student interaction		Christine																
Quantitative models																		
Student opportunities to participate in science education		Christine/Jess																
How organizational conditions affect professional learning		Kathryn/Jess																
Capacity																		
Pivotal district structures to support elementary science		Kathryn																
How a professional learning approach supports district capacity building		Kathryn																
Differences in science capacity across districts		Kathryn																
Capacity literature review		Kathryn/Kristi																

Lessons Learned

- In the proposal, develop a coherent through line
  - Create a theory of change, define how it works, and support it with the literature
  - Theory, methods, and argument should align
  - Define your main constructs, and use the same words every time
- Cultivate a relationship with site and district administrators. This supports
  - Recruitment and research
  - Science education
- Equity should be front and center

Questions?

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SONOMA STATE UNIVERSITY

Make Math: Realize Equity to Activate Learners

Make Math REAL

Building Authentic Math from Maker Experiences in Upper Elementary Grades

Ben Ford
Sonoma State University

Joint with: Rajeev Virmani and Kathy Morris (SSU), Harold Asturias, Karen Mayfield-Ingram, and Rena Dorph (Lawrence Hall of Science, UC Berkeley), and a host of teacher co-developers

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Funding provided through award numbers DRL-1850372 (SSU) and DRL-1850367 (UCB)

SONOMA STATE UNIVERSITY

Make Math
Realize
Equity
to Activate
Learners

Make Math REAL: Realize Equity to Activate Learners GOALS

1. refine a model for Maker Learning Cycles that build from authentic maker experiences to deep engagement in and learning of core grade-level mathematics content;
2. develop 4 examples of such MLCs in each of grades 4 and 5; and
3. generate and evaluate evidence about aspects of these MLCs that contribute to opportunity to engage in mathematics and to STEM activation for students and specifically for emerging multilingual learners.

Cardboard Arcade Games

SONOMA STATE UNIVERSITY

Make Math
Realize
Equity to Activate
Learners

Make Math REAL: Realize Equity to Activate Learners HYPOTHESES

1. authentic maker experiences provide opportunities for deeper engagement and inquiry for emerging multilingual learners, change teachers' perceptions of these learners' capacities, and prime student STEM activation in the dimensions of fascination, competency beliefs, and innovation stance (see definitions in Theoretical Framework).
2. these maker projects position students' mathematics learning within meaningful contexts that enable deeper engagement and thus greater success, leading in turn to more persistence in STEM pursuits.

Slime Kitchen

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Make Math
Realize Equity to Activate Learners

Make Math REAL: Realize Equity to Activate Learners DESIGN and DEVELOPMENT

Year 1 (2019–~~2020~~2022): Four teams draft and pilot Maker Learning Cycles (SSU 4th & 5th; LHS 4th & 5th)

- Each team: University facilitator + 3 classroom teachers

Year 2 (2022–23)

- Revise MLCs based on pilot feedback; add language supports and strategies
- Field test revised cycles
- Student Activation and Teacher Learning Research data collection
- Final revision, Research analysis, publication

Build a Yardstick

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Make Math Realize Equity to Activate Learners

Letterform Studio

What is a Maker Learning Cycle?

Making something REAL: authentic Maker project

Making Math REAL: 2+ Math follow-on lessons

Making it all come together (Cycle Finale)

- Fermi Problem OR Revisiting Making OR Where Else in the World?

	Maker Experience **Letter Art** Students create geometric art using their initial, and observe shapes that appear.	*x min*
	Follow-On Lesson 1 **Angles Around a Point** Students measure angles around a vertex in their artwork, and compare the total when added with their classmates.	*x min*
	Follow-On Lesson 2 **Angles Around a Shape** Students choose a shape in their artwork and measure the angles around the shape, compare the sum of those measures with their classmates', and notice patterns and features of shapes.	*x min*
	Cycle Finale **Mount and Hang Your Art** **Compare with Other Artists** Students mount their letter art for display in the classroom. They compare their work with other artists who used similar techniques. They find and sketch interesting shapes and angles around school, and assemble a class gallery of shapes and angles they find.	*x min*

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Make Math Realize Equity to Activate Learners

Robot Shop

Making Enables Powerful Math Learning

Maker community principles

- Access for everyone, learning from each other
- Authenticity
- No pre-teaching beyond familiarity with tools/materials

These lead to:

- Math learning principles, e.g.
  - Authenticity: Math *for a purpose*
- Language development principles
  - Communication *for a purpose*

Chef ramsay, josh and sebas

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Make Math Realize Equity to Activate Learners

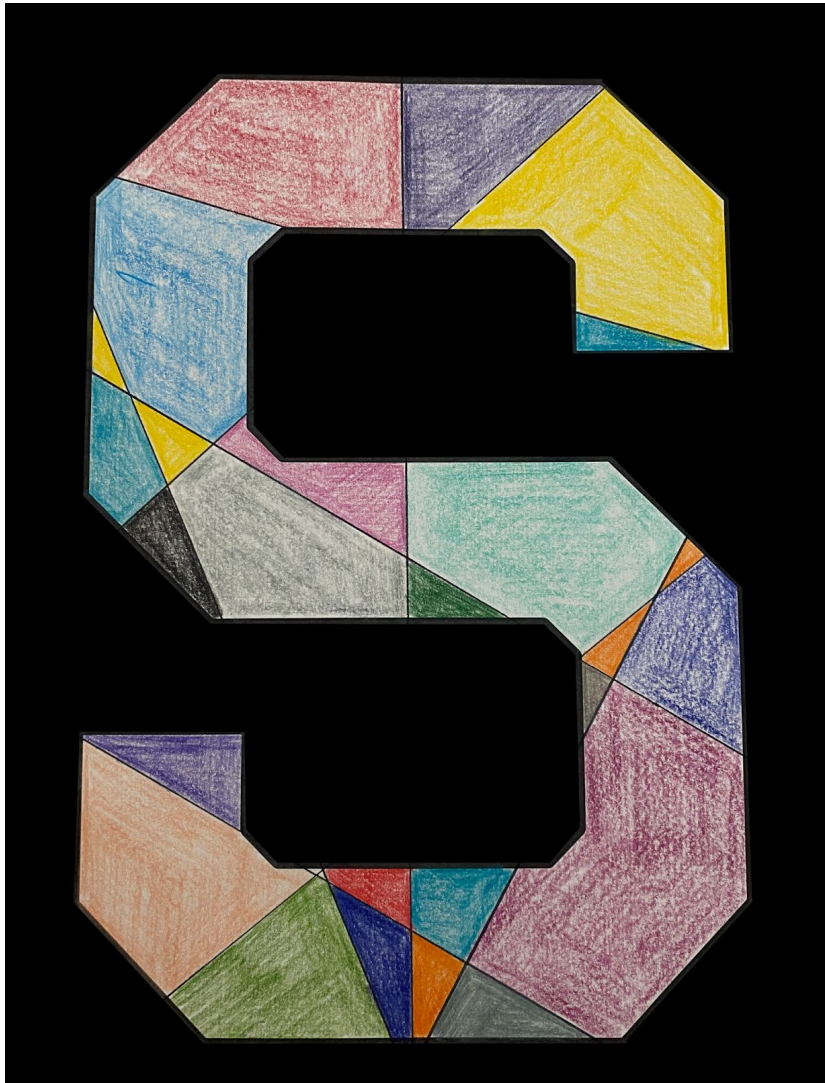
Make Math REAL Research

Student *Activation* in STEM

- A state composed of dispositions, practices, and knowledge that enables success in proximal science, technology, engineering, art, and mathematics learning experiences.
- Main question: Do MLCs lead to increased STEM activation for emerging multilingual learners?
- activationlab.org

Teacher noticing of emerging multilingual learners' assets

- Surveys, interviews, classroom observation



Letterform Studio

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Make Math Realize Equity to Activate Learners

Results & Lessons Learned

2022–23 is primary research data year for both student and teacher research

2021–22 student data: high engagement relative to non-MLC math time

Teacher practice

- Giving access for productive struggle is hard
- Allowing for productive struggle (resisting urge to “help”) is hard
- Radical paradigm shift like Maker principles can help

Robot Shop

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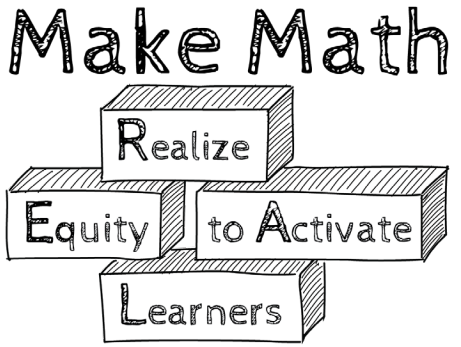

Questions?

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Innovations in STEM Teaching and Teacher Training and Development

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Next Steps/Closing Remarks

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Office of the Chancellor

https://www2.calstate.edu/impact-of-the-csu/research/stem-net

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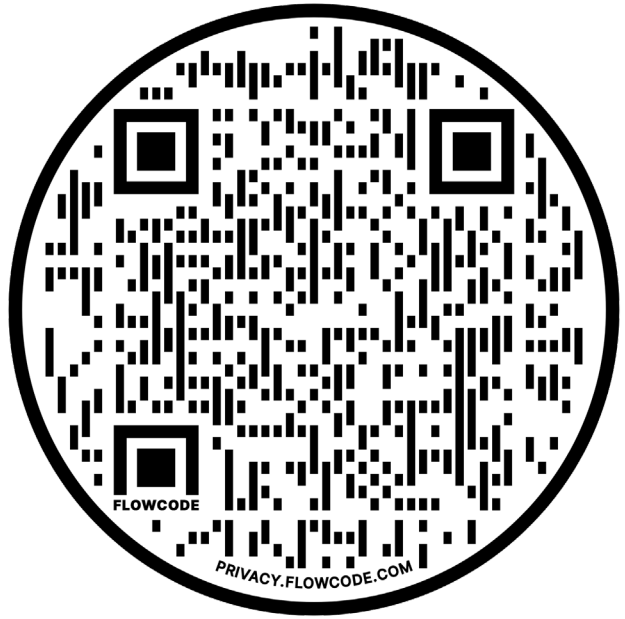
STEM-NET FEEDBACK

Webcast Feedback Survey

Please take a few moments to tell us about your webcast experience.

Use the QR Scan Code to download it



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STEM-NET Upcoming Events

Virtual Research Café 10.0

Date: Wednesday, September 21, 2022
Time: 11 AM-12 PM

Register Here

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STEM- NET Communities

Join our CSU STEM-NET Community listserv

csustemnet@lists.calstate.edu

Begin a Conversation with Colleagues and Join our Private CSU STEM-NET Facebook Group

https://www.facebook.com/groups/2629611737269292

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THANK YOU FOR JOINING US TODAY!
For more information about STEM-NET visit our website:

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