CSET | Center to Support Excellence in Teaching

THE USE OF VIDEO AS A TOOL FOR PROFESSIONAL DEVELOPMENT AND RESEARCH ON TEACHER LEARNING

FERA Conference on Education
Rovaniemi, 2017

Stanford | GRADUATE SCHOOL OF EDUCATION

Celebrating the Centennial

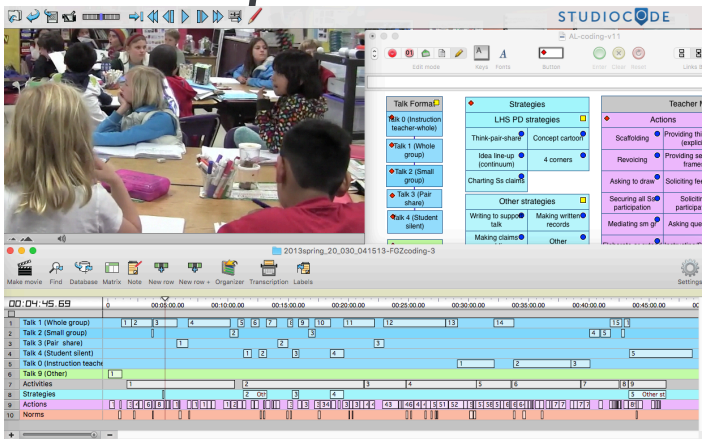
- *Stanford Graduate School of Education is celebrating its centennial in 2017*
- *Finland became an independent state on 6 December 2017*

Power of Video for Professional Development

- *Captures richness of classroom*
- *Records unnoticed aspects of classrooms*
- *Shared experience for PD participants*
- *Focus on specific features of classroom*
- *Can be stopped and replayed*
- *For use in face-to-face or virtual PD*

Power of Video for Research

- *Captures richness of classroom*
- *Records the unnoticed*
- *Provides a permanent record*
- *Address a wide range of questions*
- *Address emerging research questions*



The Need for High Quality TPD

Never before in the history of education has greater importance been attached to the professional development of educators.

Guskey, 2000

If we want schools to offer more powerful learning opportunities for students, we must offer more powerful learning opportunities for teachers -- opportunities that are grounded in a conception of learning to teach as a life-long endeavor….

Borko, Jacobs & Koellner, 2010

Characteristics of Effective PD

… we have reached a consensus that these core features play an important role in determining the effectiveness of professional development, that they are features of PD worth testing.

Desimone, 2009

- *Content focus*
- *Active teacher learning*
- *Collective participation*
- *Coherence*
- *Duration*

Toward a Research Agenda

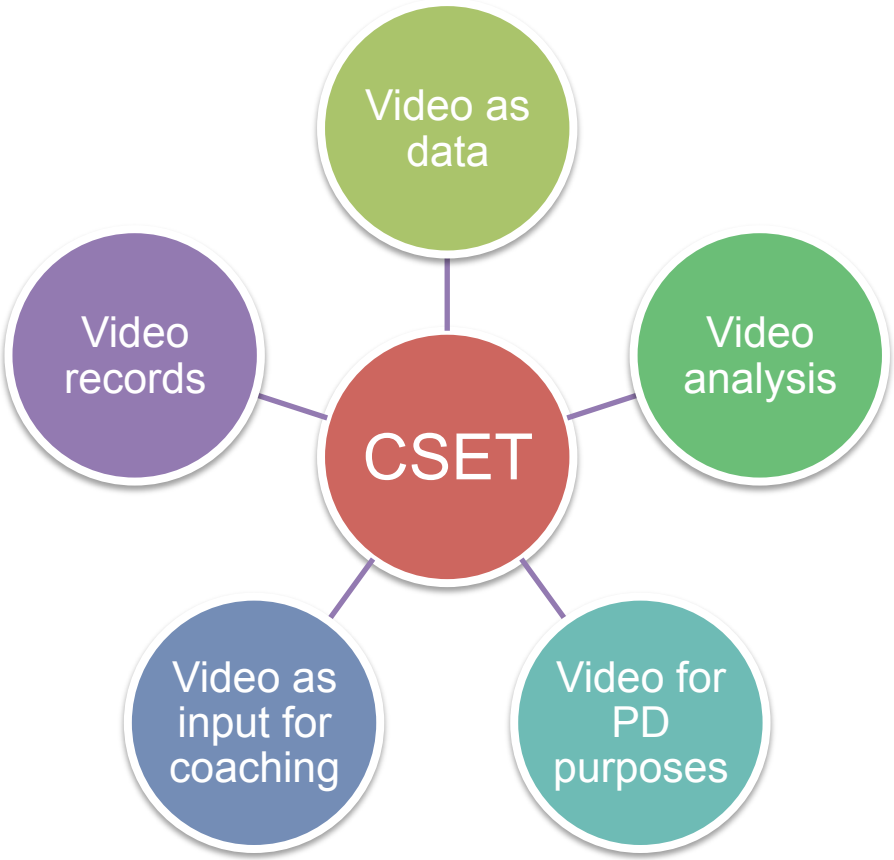
- *Features are necessary but not sufficient*
  - *Mixed research results*
  - *Not specific enough to guide decisions (Wilson, 2013)*
- *Practice-based PD (e.g. Ball & Cohen, 1999)*
  - *Situates professional learning activities in practice using records of practice (e.g., videos)*
  - *Studies practice systematically through these records*

CSET Professional Learning Experiences

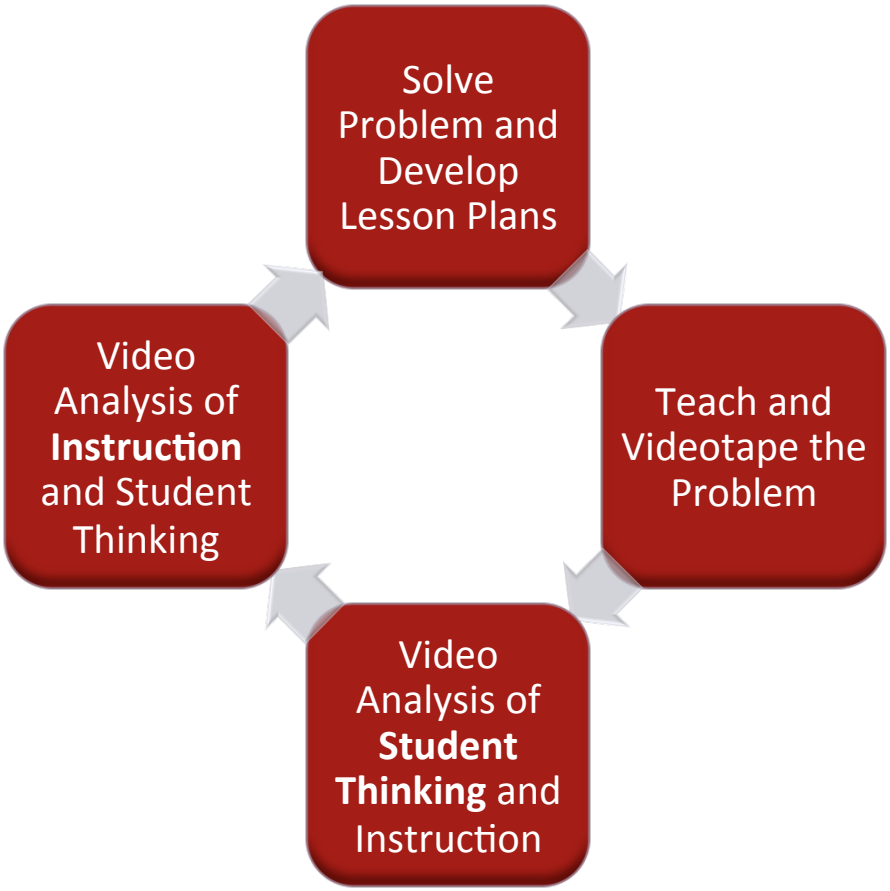
*CSET is driven by a vision of classrooms where **all students** are learning. Our research-based professional development:*

- Is practice-based
- Develops teacher leadership
- Promotes equitable instruction

Video Projects at CSET

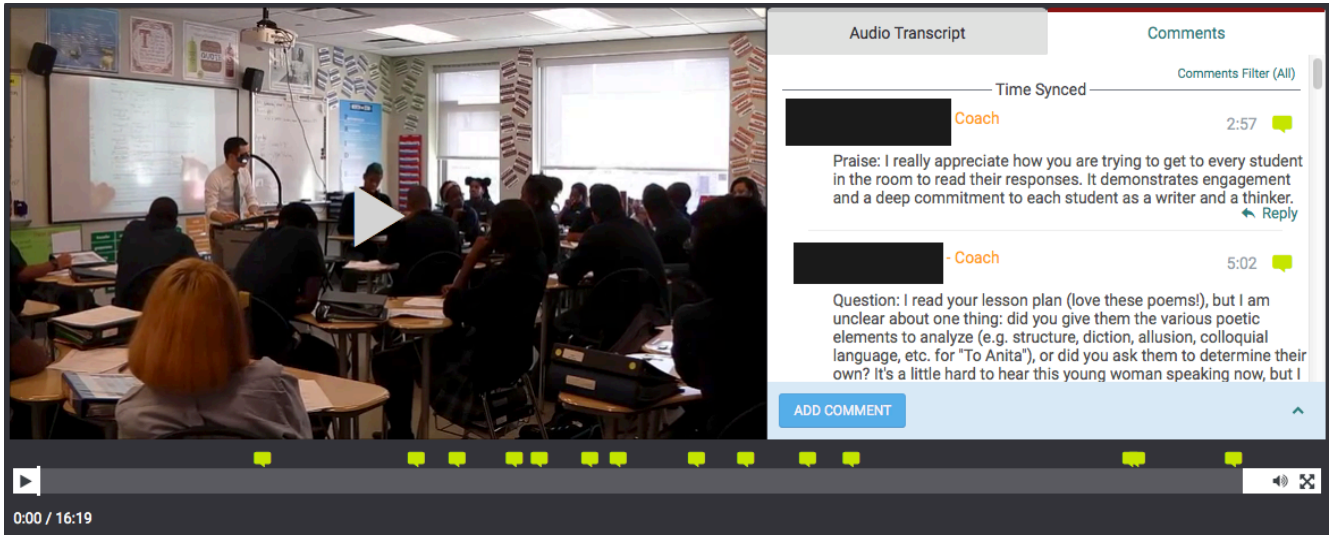


Problem-Solving Cycle and Teacher Leadership Preparation



Hollyhock Fellowship Program

SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR
Individual	Content Cluster	Individual	No Coaching	Content Cluster	Individual OR Content Cluster		Individual
Set Overarching Goals	Video Upload #1			Video Upload #2	Video Upload #3		Reflect on Overarching Goals



THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

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THE PrAcTISE PROFESSIONAL DEVELOPMENT PROGRAM:

Fostering Science Discourse in Elementary Classrooms

PRACTISE
Practicum Academy To Improve Science Education
Lawrence Hall of Science & Stanford Graduate School of Education

Project Partners

Stanford University

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- **Emily Reigh**
- Anita Tseng
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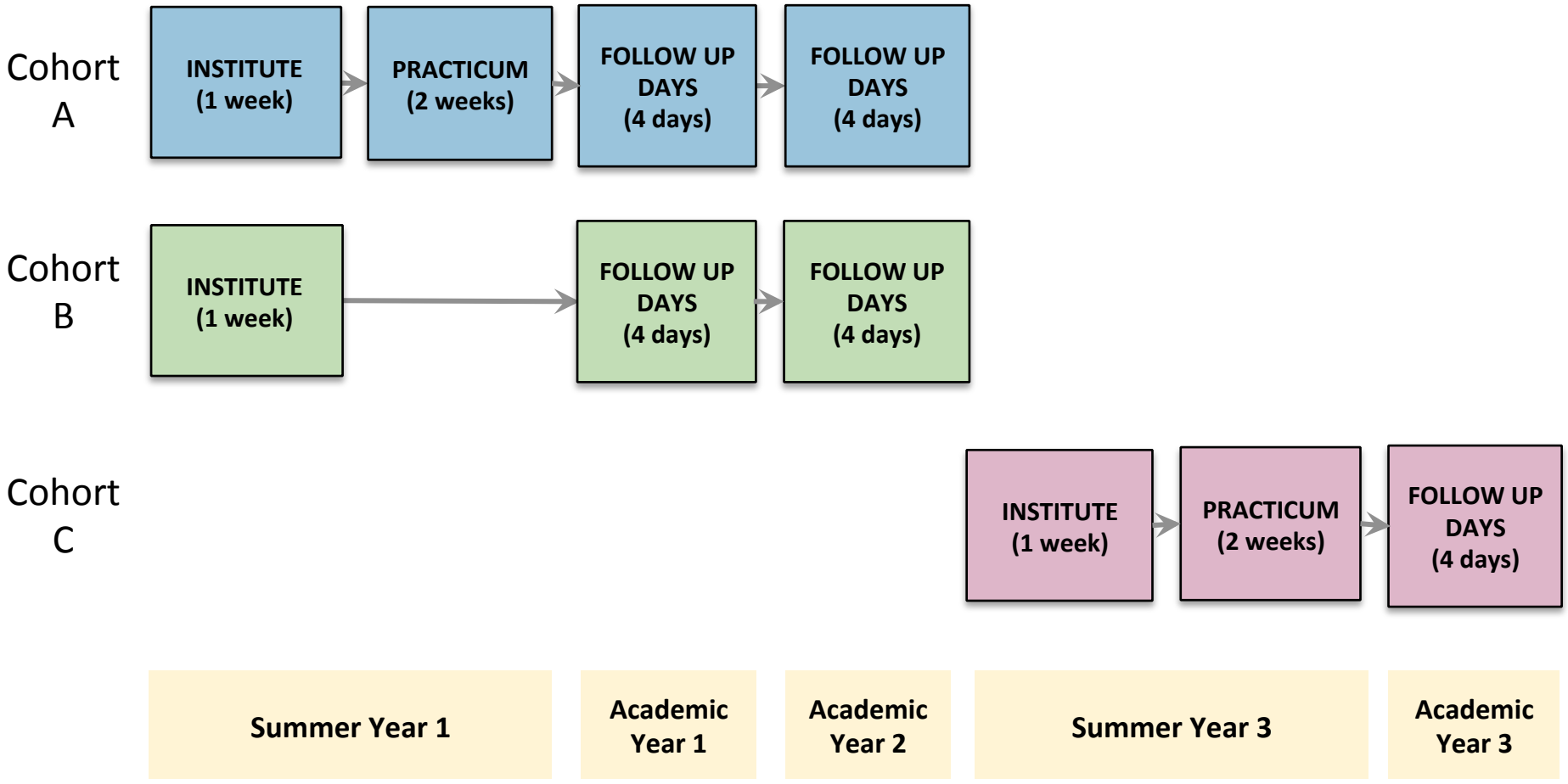
Project Goal

To **develop** and **study** a professional development program for elementary teachers to engage and support students in scientific discourse and reasoning with evidence

The PrAcTISE Professional Development Program



Professional Development Practices

	Institute	Practicum	Follow-Up
Facilitator Presentations	X		
Facilitator Modeling	X		X
Analysis of Instructional Strategies	X		X
Practice Teaching		X	
Video-based Discussions		X	X
Reflection	X	X	X
Planning	X	X	X

Reflection Group: Video-Based Discussion

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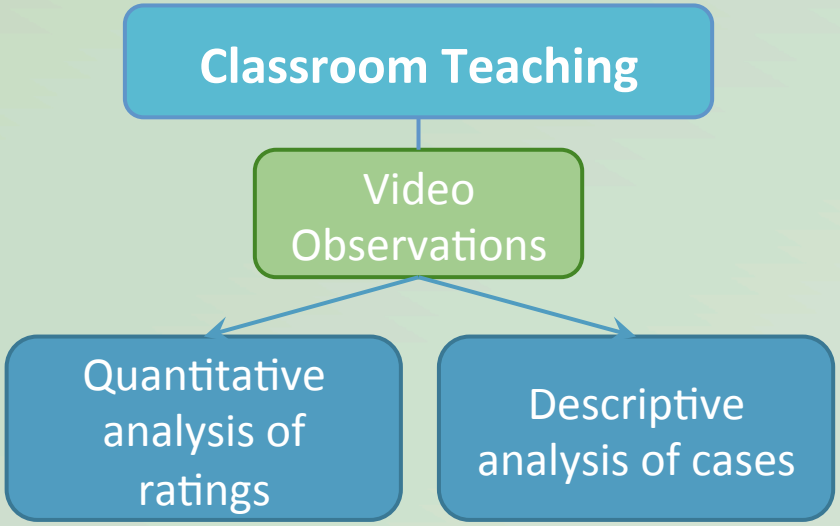
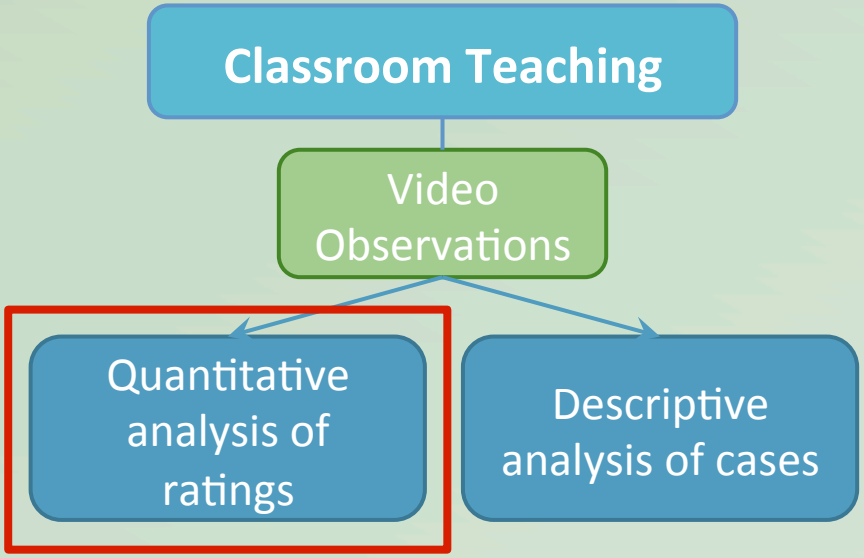
Research Design



Research Design



Research Questions

1. To what extent, if any, does elementary teachers' participation in a PD program focused on discourse and argumentation in science influence classroom discourse practices?
2. What differences in student and teacher discourse practices, if any, are associated with teachers' participation in the practicum and non-practicum versions of the PD program?
3. Is the impact of the revised Academy model (Cohort C) different than the impact of the original model (Cohort A)?

Methods

Participants

- Large urban school district
- Elementary school teachers in grades 3, 4 & 5
- Cohort size at baseline: A: 18, B: 17, C: 20
- Table displays numbers during final year

	# Teachers	Average Years Teaching	# Schools	Eligible Free/ Reduced Lunch
Cohort A	9 (90% female)	10.7	5	46.1%
Cohort B	10 (90% female)	8.8	8	75.2%
Cohort C	15 (87% female)	13.1	10	69.2%

Assessing the Quality of Classroom Discourse in Science

Science Discourse Instrument (SDI)

Teacher Practices	Student Practices
1. Ask	4. Explain
2. Press	5. Co-construct
3. Link	6. Critique

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Assessing the Quality of Classroom Discourse in Science

Science Discourse Instrument (SDI)

Teacher Practices

1. Ask
2. Press
3. Link

Are seeds alive?

How do you know? Can you tell me more about that?

What's the difference between what Mary and Toni said?

Assessing the Quality of Classroom Discourse in Science

Science Discourse Instrument (SDI)

Student Practices

4. Explain
5. Co-construct
6. Critique

I think seeds are alive because they can produce life.

I want to add to what Ariel said.

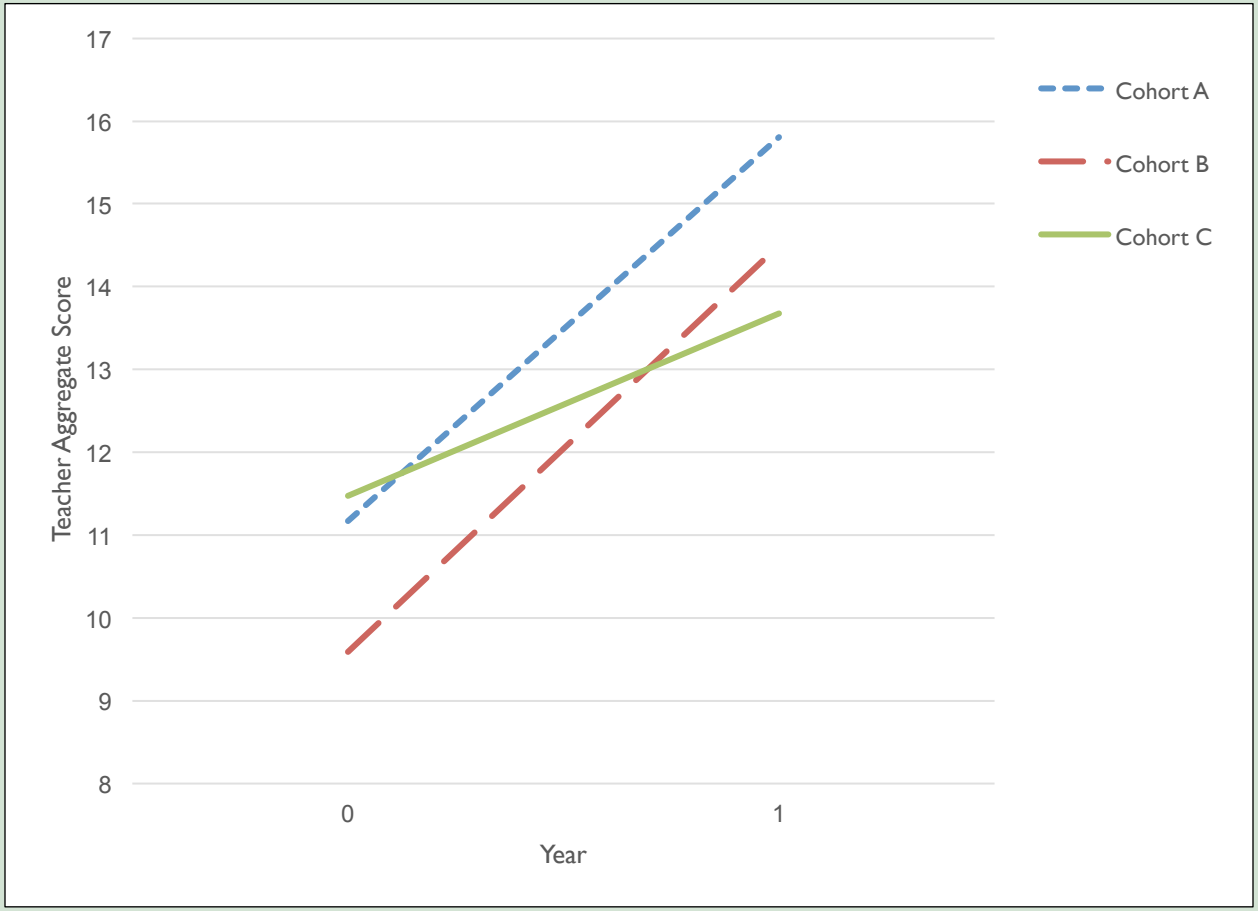
I disagree, because...

Analysis of Classroom Videos

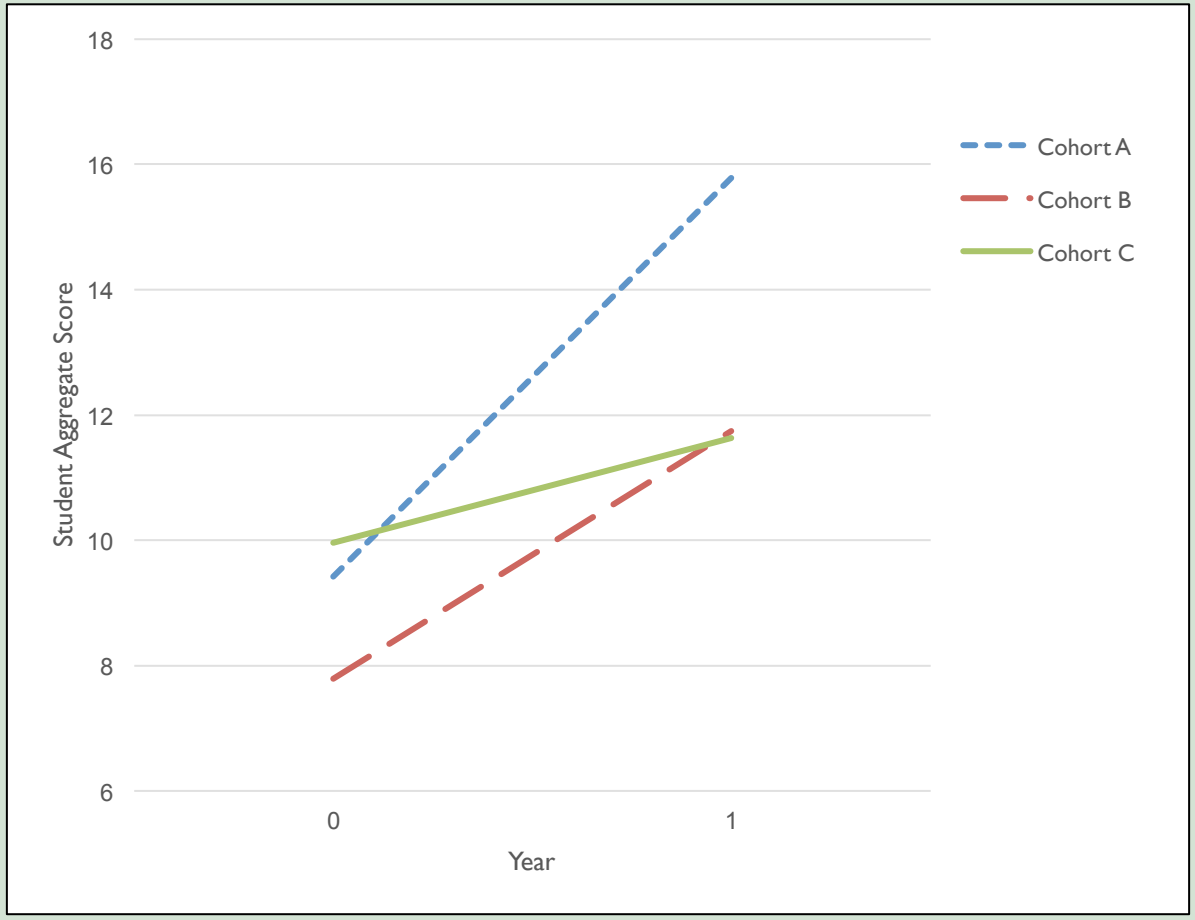
- Teachers video recorded at least 2 times each year
- ~300 classroom videos from Year 0 (Baseline) and Year 1, 2 & 3 in the project
- 0-4 rating scale for each discourse practice
- Each video rated by two independent raters
- Raters reached consensus

Findings

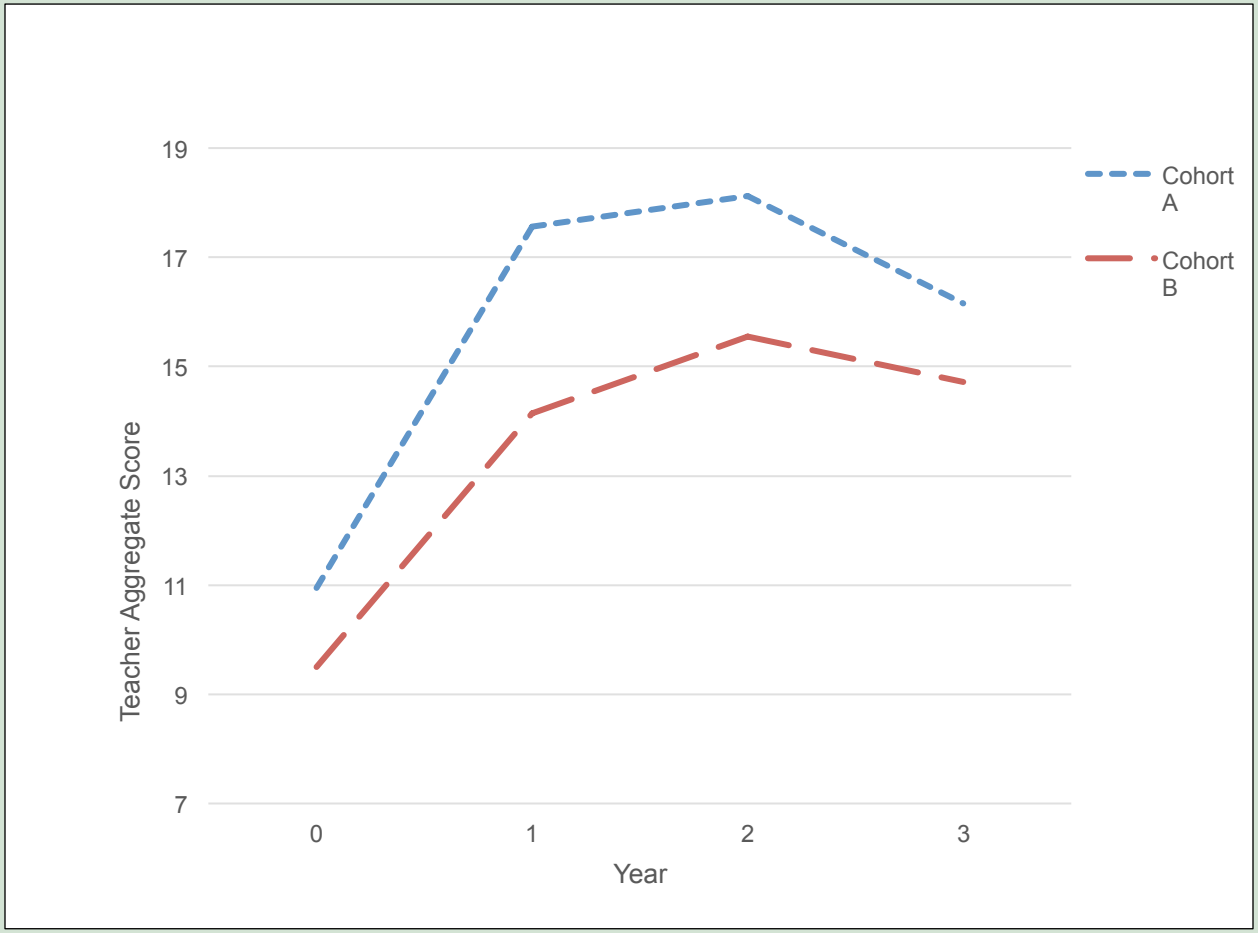
Aggregate mean scores for **Teacher** Discourse Practices for Cohort A, B and C and their change between Year 0 (baseline) and Year 1



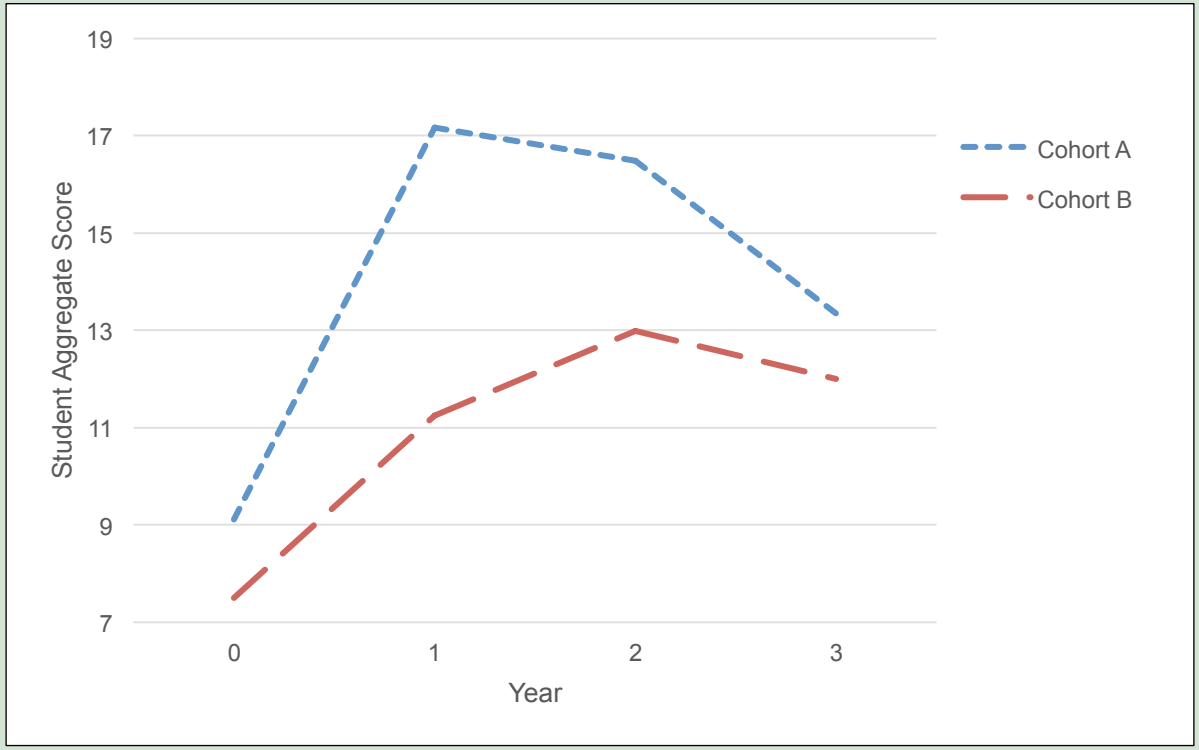
Aggregate mean scores for **Student** Discourse Practices for Cohort A, B and C and their change between Year 0 (baseline) and Year 1



Cohorts A & B: Mean Score for **Teacher** Discourse Practices from Year 0 to Year 3



Cohorts A & B: Mean Aggregate Score for **Student** Discourse Practices from Year 0 to Year 3



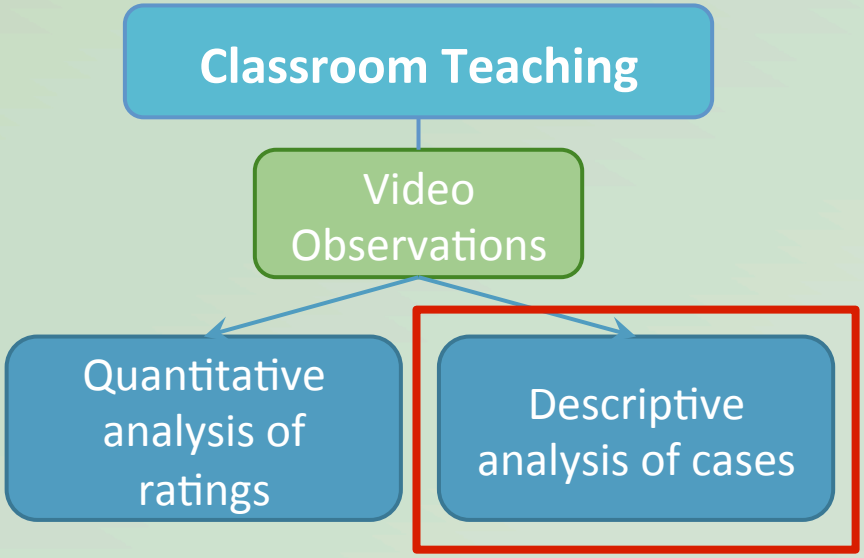
Conclusions (by Research Question)

1. Impact of PD on classroom discourse practices?
   - Across all cohorts, discourse practices improved
2. Differences in discourse practices associated with practicum vs. non-practicum versions of PD?
   - No significant differences over 4 years
3. Differences in impact of the original and revised model?
   - No significant difference for teacher practices
   - Significant difference for student practices – less impact for Cohort C

Possible Explanations

- Lack of practicum effect:
  - Challenges of working with unfamiliar students in an unfamiliar setting
  - Benefits of follow-up days during the school year
- Why Cohort C (revised version) didn't do better
  - Changes in district context
- Lingering questions
  - Specific nature of the changes
  - Relationship of changes to PD

Case Study Research Design



Research Questions

1. How do different teachers change their practice to enhance classroom discourse and improve students' ability to argue from evidence?
2. What features of the professional development are related to the changes in the teachers' practice?

Cases

- Showed substantial increases in quantitative ratings on the SDI (low to medium or medium to high)
- 5th grade teachers
- Participated fully in all PD activities

Name	Cohort	School	Free & Reduced Lunch	Years of Teaching	Approximate Age
Tamara	A	City Unified Elementary	87%	3	50s
Margaret	A	Green Hills Elementary	12%	15	50s
Alice	B	Garden Elementary	83%	18	40s
Eileen	B	International Cooperation	95%	7	30s

Data

- Teacher classroom videos (40-60 minutes)
  - T0 (2 lessons)
  - T1 (3 lessons)
  - T2 (3 lessons)

What Changes Do You Notice?

Before sharing our methods and findings, I'd like you to watch 2 short video clips of one teacher's instruction before and after the PD and think about the first research question:

> *How do teachers change their practice to enhance classroom discourse and improve students' ability to argue from evidence?*

Margaret's Instruction Before PD

Video removed

Margaret's Instruction After 1 Year

Video removed

What differences do you notice?

Analysis 1: Talk Formats

Percentage of lesson time dedicated to:

- Whole group

Instruction	Teacher-driven discussion	Student-driven discussion
Not interactive	Interactive	Interactive
Teacher controls ideas	Teacher controls ideas	Students control ideas

- Small group
- Pair work
- Individual

Analysis 2: Support and Invitation Teacher Talk Moves

Scientific Supports *The teacher…*	**Scientific Invitations** *The teacher invites students to…*
Make observations/state facts *"Dirt is flowing to the bottom of the bucket."*	Make observations/state facts *"What do you see happening in the bucket?"*
Provides a claim *"The boy in the cartoon says that seeds are alive."*	Provide a claim *"Do you think seeds are alive or dead?"*

Talk Moves: Cognitive Demand

	Scientific Support *The teacher...*	Scientific Invitations *The teacher invites students to….*
Level 1	States facts Makes observations	State facts Make observations
Level 2	Makes claims	Make claims
Level 3	Gives evidence/reasoning Compares/critiques claims	Give evidence/reasoning Compare/critique claims

Themes across Cases

1. Increase in **interactive** talk formats.
2. Increase in **student-driven** discussion in whole group talk formats.
3. Increase in the **cognitive demand** of teacher moves.

How two teachers, Margaret and Tamara, instantiated each theme differently.

Theme 1: Interactive Talk Formats

Margaret			
	Time 0	Time 1	Time 2
WG: Instruction	36%	13%	21%
WG: Teacher-driven	28%	9%	9%
WG: Student-driven	0%	45%	44%
Small Group	23%	11%	21%
Pair Share	4%	4%	1%
Individual	9%	18%	5%

Tamara			
	Time 0	Time 1	Time 2
WG: Instruction	57%	16%	20%
WG: Teacher-driven	30%	1%	15%
WG: Student-driven	1%	68%	23%
Small Group	3%	12%	39%
Pair Share	8%	3%	1%
Individual	1%	0%	2%

WG: whole group

Theme 1: Interactive Talk Formats

Margaret			
	Time 0	Time 1	Time 2
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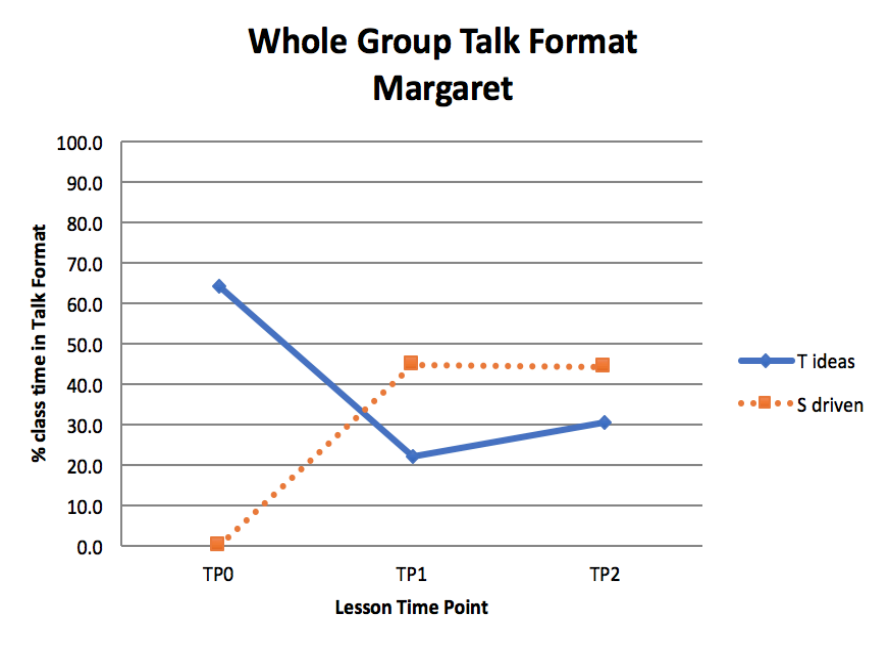
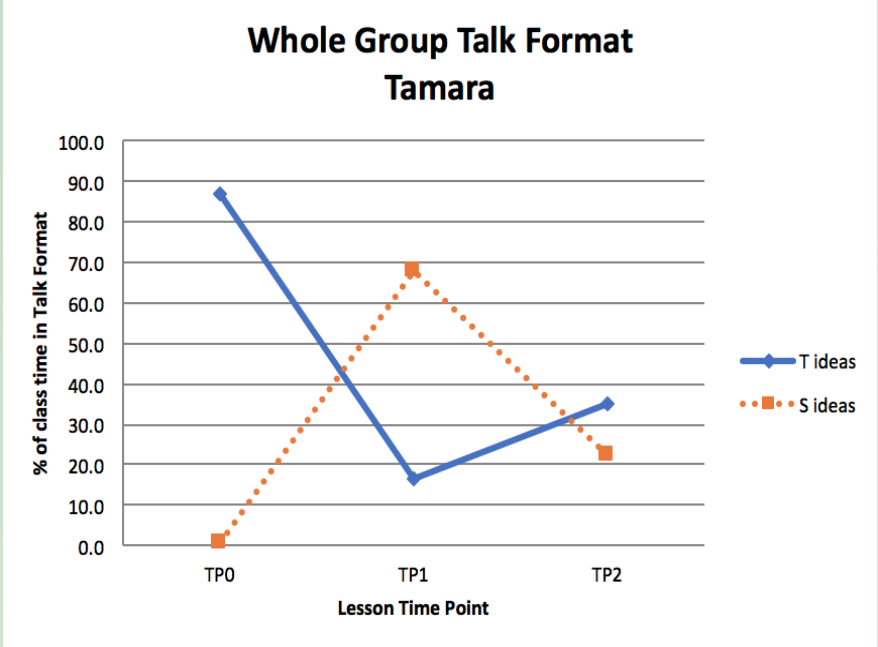
Pair Share	8%	3%	1%
Individual	1%	0%	2%

WG: whole group

Theme 2:
Student-Driven Whole Group Talk





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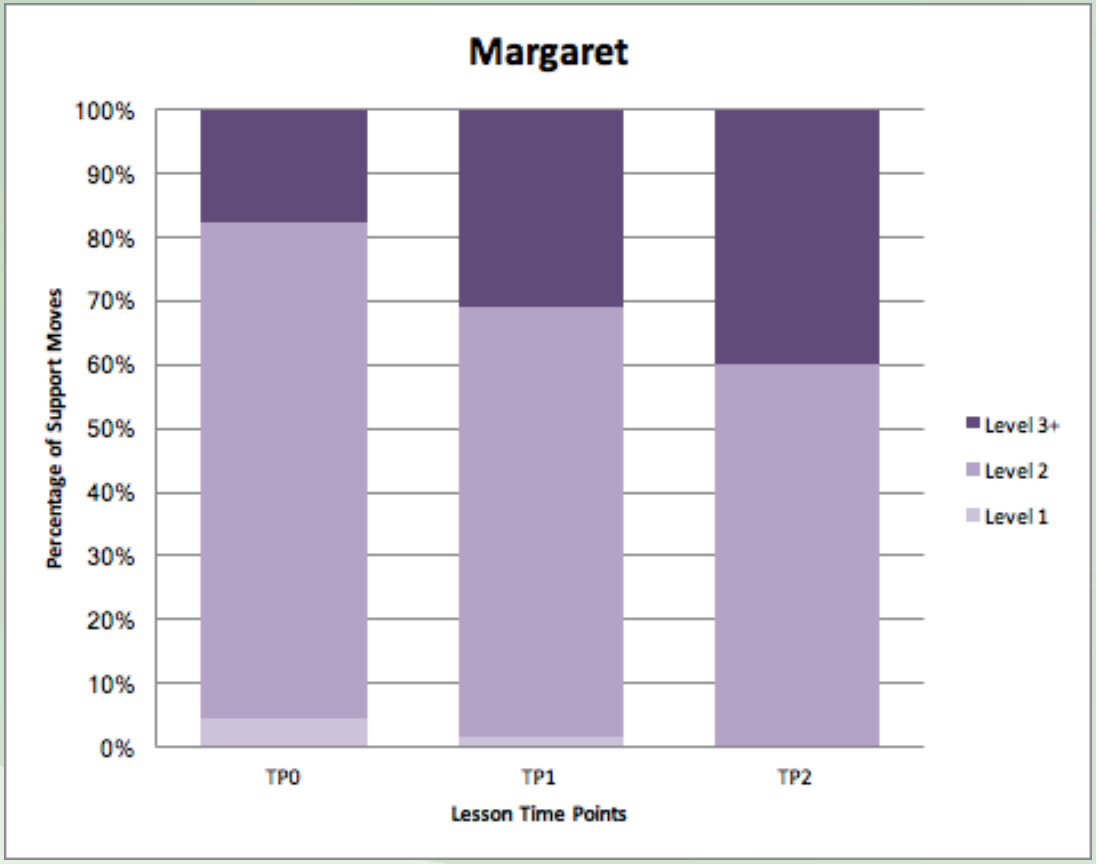
Theme 3:
Increased Cognitive Demand

	Scientific Support *The teacher...*	**Scientific Invitations** *The teacher invites students to….*
Level 1	States facts Makes observations	State facts Make observations
Level 2	Makes claims	Make claims
Level 3	Gives evidence/reasoning Compares/critiques claims	Give evidence/reasoning Compare/critique claims

Theme 3: Cognitive Demand of **Support** Moves (Margaret)



High Cognitive Demand
Support Moves (Margaret)

Linking to previous findings

"Remember when we were working with the materials in the first investigation and looking at the physical properties of the pebbles, they didn't dissolve."

Suggesting new evidence to be collected to support claims

"What do you think if we leave it overnight to see if those crystals break down?"

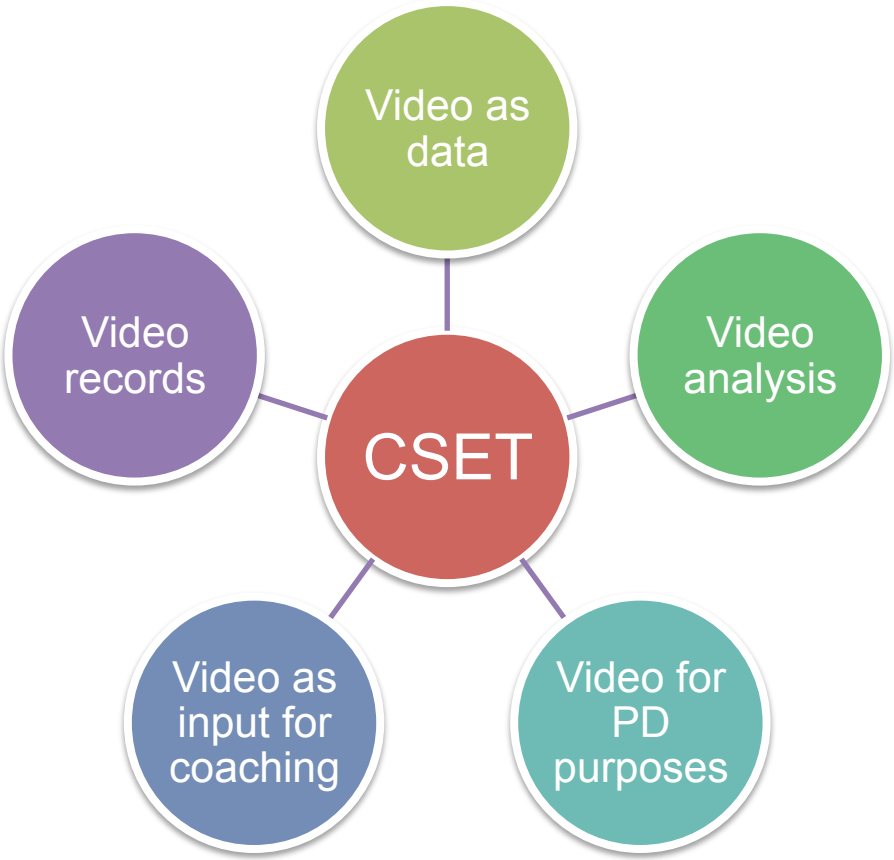
I didn't know anything about academic discussion before this. I knew what evidence was but I didn't know what a claim was. I didn't know how an academic discussion was different from a regular classroom discussion, so I learned all about that through the program. (Margaret, final interview)

I learned how to teach students the art of academic discussions, science talks, and how to make claims and find or investigate supporting evidence. I also learned what constitutes argumentation, and its place in the classroom. (Tamara, final interview)

Conclusions and Implications

- Coherent practice-based PD of sufficient duration can help teachers change science discourse in their classrooms
- Improving classroom science discourse can be achieved through different means:
  - Interactive talk formats
  - Allowing student ideas to drive whole group talk
  - High cognitive demand teacher support and invitation moves
- Individual teachers change in different ways.

Video Projects at CSET



Technology and Expanding Video Options

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THANK YOU!

KIITOS!

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