Rapid Improvement through Design Thinking within a Community of Practice

Find info from this session online: bit.ly/dthinkingimprovement
Who’s here?

Teachers

Coaches & TOSA’s

Administrators

Board Members
We believe that people working in our school systems are the one who are most capable of improving outcomes for all students.
A Community of Practice with 10 California school districts, serving nearly 400,000 students, working together
Professional Development
to support strong instructional practices

Instructional Materials
to align with higher CCSS-M demands

Leadership Capacity Building
to strengthen coherence within each district

Monitoring Approaches
to understand how each student is doing throughout the system
Find info from this session online: bit.ly/dthinkingimprovement
Workshop Objective

Each educator in the room today will……

- Leave with an initial understanding of Design Thinking mindsets and methodologies

- Experience two design-thinking models for advancing teaching and learning through Mathematics from two distinct districts across the state
Learn With Us!

Follow the Math in Common community on twitter for updates on our journey, learnings, and progress!

Find info from this session online: bit.ly/dthinkingimprovement

FOLLOW US AT @MATHINCOMMON
### Oceanside Unified School District

**Eric Frandsen**
Coordinator of Curriculum & Instruction  
*eric.frandsen@oside.us*

<table>
<thead>
<tr>
<th># Schools</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td># Teachers</td>
<td>900</td>
</tr>
<tr>
<td># Students</td>
<td>18,000</td>
</tr>
<tr>
<td>#SWD</td>
<td>350</td>
</tr>
<tr>
<td>%ELLs</td>
<td>34%</td>
</tr>
<tr>
<td>%FRPL</td>
<td>83%</td>
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### DINUBA Unified School District

**Michael Akins**
Director, Educational Technology and Instructional Program Analysis  
*michaela@dinuba.k12.ca.us*

<table>
<thead>
<tr>
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</tr>
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<tbody>
<tr>
<td># Teachers</td>
<td>334</td>
</tr>
<tr>
<td># Students</td>
<td>6,591</td>
</tr>
<tr>
<td>#SWD</td>
<td>449</td>
</tr>
<tr>
<td>%ELLs</td>
<td>33%</td>
</tr>
<tr>
<td>%FRPL</td>
<td>78%</td>
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What do you see?
Missed Opportunities
A CLOSER LOOK
How do holdfasts fit into the marine ecosystem?

They provide shelter for millions of marine organisms!
A simple holdfast offers…….

...opportunities to explore:

- Relationships
- Structures
- Roles
- Models
- Cause and effect
- Purpose
- Patterns
- Questions?????
Prototype #1

**How might we create opportunities for students to use technology to effectively communicate their reasoning and thinking in mathematics?**
How might we create opportunities for students to use technology to engage in discourse about their reasoning and thinking in mathematics?

**PROTOTYPE:**
- A definition
- A rubric
- A few digital tools (Seesaw, Showme apps)
We experienced victories...

Seesaw:
● easy to use
● offers a variety of access points
● a means of documenting students’ thinking.

Our rubric prompted productive dialogue in regard to the types of discourse students are engaging in.

...and a challenge
Not all team members consistently utilized the rubric - our key source of information about the impact of our prototype.
We learned:

- **Problem**: shifting the frequency and quality of discourse is relevant to teachers

- We were asking the wrong **question** - shift from utilizing tech to promoting quality discourse
Why a focus on discourse?

“Teachers of high-achieving students [spend] about 55 percent of the class time talking, compared with 80 percent for teachers of low-achieving students.” – Flanders, 1970

“In classrooms with higher numbers of students living in poverty, teachers talk more and students talk less.” – Lingard, Hayes, and Mills (2003)

“English language learners in many classrooms are asked easier questions or no questions at all and thus rarely have to talk in the classroom.” – Guan Eng Ho, 2005
Common Challenges

Academic Vocabulary

Explaining procedures, not concepts

Hesitant to Speak

Engagement

Asking good Questions

Structuring Conversations

Relevant Conversation
Analyze teacher feedback

“We need video examples of students ... having effective discourse, based on students communicating and sharing their thinking and strategies.”

“[We need] more training for teachers on modeling deeper communication of reasoning.”

“Students are very engaged when illustrating their work, and they are engaged when listening to others talk about their work. Students are excited to explain and share what they did”
Math Empowerment Group (MEG)

MEG is a group of OUSD educators interested in working together in 2017-18 to try out and revise specific approaches and tools designed to increase effective student discourse in our math classrooms.

WE BELIEVE: The quality of student discourse depends upon routines and practices within the learning environment.
Can we prompt discourse?

Can we increase discourse quality?

3-BAY INSTITUTE

PICK A STRATEGY

UNPACK DISCOURSE

FALL 2017

SUMMER 2017 LAUNCH

TEST 1-2

TEST 3-4

TEST 5-6

TEST 7-8

Summer 2017 Launch

● Unpack discourse

● Set goals

● Pick a strategy
Three key elements of classrooms in which discourse is frequent and of high quality:

- Classroom culture
- Task design
- Purposeful tech use

- Rewording questions
- Restructuring tasks
- Question stems
Evaluate the expression below:

\[(6+5)(4-3)\]

Explain your thinking to a partner.
Categories of discourse

Procedures - Recall facts or procedures

Justification - Explain conceptual understanding

Construction - Compare, contrast, challenge

Application - Co-construct meaning, generalize, reflect.
Compare to:

**Directions:** Using the numbers 1-9, at most one time each, to fill in the boxes and make the biggest product.

\[(□-□)(□+□)\]

**Answer:** \((8+7)(9-1)\)
The *learning experience* (LE) provides opportunities for students to engage in conversations about each other’s thinking, critique each other’s thinking, build on each other’s ideas and construct viable arguments (individually or in groups).

<table>
<thead>
<tr>
<th>Procedures</th>
<th>Justification</th>
<th>Construction</th>
<th>Application</th>
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<tbody>
<tr>
<td>Students engage in conversations with the teacher and/or with each other with a focus primarily on facts and procedures.</td>
<td>While engaged in conversations with the teacher and/or with each other, students explain and/or document conceptual understanding of content (not just procedures)</td>
<td>Students engage in conversations that require them to compare, contrast and/or challenge each other’s thinking.</td>
<td>Students <strong>build on each others’ contributions and co-construct meaning</strong> to move toward deeper understandings. Students generalize and reflect.</td>
</tr>
<tr>
<td>(e.g. “First, I added, then I subtracted…” )</td>
<td>(e.g. I added because…, I divided in order to…”</td>
<td></td>
<td></td>
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% of Student Discourse in Each Category

% of Observations

- Not
- Proced
- Justific
- Constru
- Applica

Bar chart showing the percentage of observations in each category.
4 essential components for project success:

Communication - *Is there a plan to ensure frequent and clear communication (e.g. data, meeting notes, etc.)*?

Clarity of project - *Do all participants understand their roles, the prototype, timelines and measures of success?*

Measuring Progress - *Do the measurement processes and/or device(s) provide info that is useful and actionable?*

Collaboration Plan - *Is there a schedule for consistent and deliberate times to review data and make adjustments?*
Next steps

1. Continue to use our reflection tool to better understand:
   a. The current state of discourse in our classrooms
   b. The degree to which we are able to influence the type of discourse students are engaged in

2. Continue the monthly “huddles” to ensure teachers are able to share their experiences and build on each other’s thinking.
We have the Plan already!
Human Centered Empathy Model

Design Thinking Institute 1
Human Centered Empathy Model

Human-centered design is premised on **empathy**, on the idea that the people you’re designing for are your roadmap to innovative solutions. All you have to do: empathize, understand them, and bring them along with you in the design process.

**Empathy** - Empathizing with the people you’re designing for is the best route to truly grasping the context and complexities of their lives. But most importantly, it keeps the people you’re designing for squarely grounded in the center of your work.
# Design Thinking Basics

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
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<tbody>
<tr>
<td>Empathize</td>
<td>Learn about the audience for whom you are designing by observation and interview</td>
</tr>
<tr>
<td>Define</td>
<td>Create a point of view that is based on user needs and insights</td>
</tr>
<tr>
<td>Ideate</td>
<td>Brainstorm and come up with as many creative solutions as possible</td>
</tr>
<tr>
<td>Prototype</td>
<td>Build a representation of one or more of your ideas to show to others</td>
</tr>
<tr>
<td>Test</td>
<td>Share your prototyped idea with your original user for feedback</td>
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The Surveys and Interviews

Research (Gathering and Using Information)
178 responses

- No student opportunities: 25.8%
- 1-2 times per month: 68%
- 1-2 times per week: 2.3%
- Every day: 2.3%
Institute II – Yikes Were Behind!

Ideate, Ideate, Ideate
The Plan and Rollout

“The Model Classroom”
Test and Iterate

- Patti (2nd)
- Nadira (3rd)
- Mark (5th)
- Andy (6th)
- Lisa (6th)
- Jamila (6th)
- Kristin (4th)
Focus Shift – The Gathering


Empathize  Define  Ideate  Prototype  Test
Focus Shift - The Gathering


HMW: Leverage the MCR and use Design Thinking to develop systems that will have a sustainable impact on DUSD's instructional technology integration challenges?
Focus Shift - The Gathering

Build Around the Culture
Rapid Prototyping

Jamila (6th)

Patti (2nd)

Nadira (3rd)

Kristin (4th)

Lisa (6th)

Mark (5th)

Andy (6th)
The Initial Team

- Jamila (6th)
- Mark (5th)
- Lisa (6th)
- Andy (6th)
- Nadira (3rd)
- Patti (2nd)
- Kristin (4th)
- Delaine (k-12)
- Jeran (k-12)
- Mike (k-12)
- Megan (k-12)
- Mike (k-12)
- Delaine (k-12)
- Jeran (k-12)
- Megan (k-12)
Model Classroom

- Tech Buddies
  - Pull-in, Push-in*
- Tech Teams (Students)
  - Push-in*
- Grade Level
  - Train Students to send back*
- Videos for site use
- Teacher Walk-in (Site and Off Site)
The Impact:

- Building Capacity to Lead
- Breaking down barriers
- Reviewing Resources
- Developing Resources
- Piloting Resources for site, grade level use
- Building Teacher Efficacy

Impact

- 7 teachers
- 200 Students
- 44 teachers
- 1,232 students
Model Classroom +1

Taking what works at each site and expanding upon the site cultures.

Coaching Teachers AND students with our OWN Teachers and Students

Grounded in the Design Thinking process of empathy and quick prototyping.
Model Classrooms +1

We just added:

- 5 more teachers
- 6 Site Coaches
- District Librarian

The Impact will GROW!

Model Classroom + ALL

- 12 teachers
- 320 Students

Impact

- 62 teachers
- 6 coaches
- 1,800 students
Model Classroom +1

Kristina (6th)
Melissa (6th)
Colleen
Robin
Mike (k-12)
Jeran (k-12)
Anna
Jane
Bronwen (6th)
Stephanie (6th)
Liz (4th)
Kristin (4th)
Minnie (2nd)
Steven (6th)
Patti (2nd)
Nadira (3rd)
Mark (5th)
Andy (6th)
Lisa (6th)
Jamila (6th)
THE 5 WHY WHY WHY WHY WHY's
The 5 Whys

Five Whys

Why do you exercise?
 Because it's healthy

Why is it healthy?
 Because it raises my heart rate

Why is that important?
 So that I burn more calories

Why do you want to do that?
 To lose weight

Why are you trying to lose weight?
 I feel social pressure to look fit
Survey vs. Interview

Building Empathy for Understanding.

Your going to do a quick survey of your partner and then you are going to interview that person. It is important to write down exactly what they say. Also pay attention to the body language. We are going to use the 5 whys process for this interview.

Survey Says

Are the current technology trainings used in your school/district supporting your instructional needs?
Human-centered Design
Getting to the Root of a Problem using the 5 Whys

Are the current technology trainings used in your school/district supporting your instructional needs?

- Capture direct quotes
- Keep it objective
- Don’t paraphrase

Define the Problem:

1. Why?
2. Why?
3. Why?
4. Why?
5. Why?

Countertmeasure:
How do we stop this from happening again?
More Questions or Answers?

Don’t forget to bring home a bookmark, which has our contact information and Online Community Space website:

bit.ly/dthinkingimprovement