

Distinguished Teacher in Residence Program

Plan Proposal, Partnership Professional Development for AY 2020-2021

Title of Grant Proposal: Integrating Student Discourse Throughout the Mathematics Curricula via Pedagogical Routines: Equity and Access via Authentic Student Voice


Involved Faculty: Ingrid Flores, Ed.D and Sean Nank, PhD

Faculty Position for Academic Year: Full Professor Associate Professor Assistant Professor FERPer

Partnering District(s): All districts in the DTiR consortium

Proposal: <input checked="" type="checkbox"/> New Project <input type="checkbox"/> Continuing Project	Total Number of Units Requested:	6
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Signature(s):

<u>Ingrid Flores 4/18/20</u> <small>CSUSM Faculty Member, Signature & Date</small>	
 <u>4/14/2020</u> <small>CSUSM Faculty Member, Signature & Date</small>	

1. **Type of Project** Applied Scholarship in Educational Settings
 Conducting Research related to SOE Mission

2. **Area of focus** ELL STEM COMMON CORE
 OTHER:

3. **Proposed project.**
Describe and connect to the SOE Mission.

In alignment with the CSUSM School of Education’s mission statement, this PPD proposal seeks to capitalize on the diverse perspective and needs of all consortium districts in the DTiR program via innovative practices aligned with the Stanford Mathematical Routines initiative research specifically targeting integrated classrooms consisting of general education students coupled with integrated and inclusive environments for students with disabilities and English Language Learners (ELL) (Zwiers, Dieckmann, Rutherford-Quach, Daro, Skarin, Weiss, & Malamut, 2017). The innovative pedagogical practices consist of Content Routines (CR) that are integrated into the district and schools’ current mathematics

curricula. The content routines addressed include Instructional Routines (IR) and Language Routines (LR).

IR include Analyze It; 5 Practices; Aspects of Mathematical Modeling; Card Sort; Extend It; Fit It; Graph It; Math Talk; Algebra Talk; Number Talk; Notice and Wonder; Poll the Class; Take Turns; Think, Pair Share; and Which One Doesn't Belong.

LR include Stronger and Clearer Each Time; Collect and Display; Clarify, Critique, Correct; Information Gap; Co-Crafted Questions; Three Reads; Compare and Connect; and Discussion Supports.

All Instructional and Language Routines are designed to promote equitable and creative solutions regarding access to mathematical content, procedures, and CCSS-M via rich conversations originating with student thought, student conceptualization of mathematical knowledge, and student vocabulary. Each IR and LR integrates individual think time endorsing culturally proficient methods for equality of voice followed by varying student-centered grouping strategies for students to explore the mathematics before teachers synthesize lessons using students' perspectives to formalize the mathematical language and understanding.

This PPD proposal also seeks to implicitly and explicitly create community through partnerships inclusive of all districts partaking in the DTiR consortium.

Reflective teaching will be encouraged with face-to-face and virtual interactions among the participating educators reflecting on the integration of the Content Routines with their current curricula. The educators from each district will experience key Content Routines during face-to-face workshops while Dr. Flores and Dr. Nank support the integration in classrooms via visits and virtual follow up sessions. Dr. Flores and Dr. Nank's work are principally guided with the following questions:

1. How do teachers effectively integrate a variety of student-centered pedagogical strategies into their current curricula-in-use?
2. How do teachers make meaning of student interactions during a variety of group work centered on students' conceptualization of mathematics standards?
3. Which CR do teachers integrate readily and which CR do teachers need further support for effective integration?
4. What administrative support(s) do teachers need in order to create time and space for the integration of CR in classrooms?

Dr. Flores and Dr. Nank seek to support teachers in the DTiR consortium to integrate the Content Routines in an effective manner via assistance in identifying the correct match between standards, activities, and CR. The

match is essential to effectively support students' mathematical understanding while understanding the shift to using CR is time-consuming and requires a fundamental adjustment to the ways teachers view student learning and mathematical content mastery. This shift is necessary for creating critical thinkers while fostering a positive outlook of students' mathematical abilities regardless of race, gender, orientation, and other beliefs that are historically used as hindrances to mathematical confidence and self-perception.

The outcomes for the project will be three-fold. First, educators participating in the face-to-face workshops as well as the virtual sessions will develop mastery of multiple Content Routines with the explicit goal of fostering and valuing all students' voices at every level of the K-12 mathematical experience. Second, through students' voices and perspectives, they will be afforded time and space to re-conceptualize their understanding of mathematics, thus perpetuating successful endeavors throughout their mathematical experiences. Third, Dr. Flores and Dr. Nank will conduct research and create conference proposals as well as presentations to share with the global mathematics community the importance of equity and accessibility of mathematical conceptual and procedural understanding via CR, student voice, and meaningful discussions in classroom settings.

Zwiers, J., Dieckmann, J., Rutherford-Quach, S., Daro, V., Skarin, R., Weiss, S., & Malamut, J. (2017). Principles for the Design of Mathematics Curricula: Promoting Language and Content Development. Retrieved from Stanford University, UL/SCALE website: <http://ell.stanford.edu/content/mathematics-resources-additional-resources>

4. **Detailed description of the activities.**
Provide a timeline.

NOTE: The equivalent time commitment for 3 units is approximately 135 hours and for 6 units 270 hours.

- 1) May 2020 (or upon approval of the application) Dr. Flores and Dr. Nank will submit an IRB for a mixed-methods research design to collect, analyze, and publish data concerning the endeavor. Dr. Flores and Dr. Nank will also advertise and recruit participation from every district in the DTiR consortium.
 - 2) August – December 2020 Dr. Flores and Dr. Nank will conduct strategic conversations, interviews, and classroom observations with partnering districts utilizing a Design Thinking protocol to design supportive face-to-face and virtual workshops for educators throughout the consortium. Dr. Flores and Dr. Nank will, based on input and data from districts, design a minimum of two face-to-face full day workshops as well as multiple face-to-face and virtual support workshops supporting teachers and administrators with the implementation of the Instructional and Language Routines. We
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will also develop a separate one to two-day face-to-face workshop specifically designed for site level and district level administrators as well and faculty at local universities detailing how to support pedagogical shifts in the K-12 classroom via IR and LR. All workshops will be designed for successful implementation and adaptation in the case that there is further social distancing measures during the 2020-2021 school year.

- 3) January – June 2020 Dr. Flores and Dr. Nank will conduct the face-to-face and virtual sessions with the teachers and administrators throughout the consortium. Dr. Flores and Dr. Nank will also incorporate surveys to ascertain perspectives concerning integration of the routines coupled with interviews and participant-observations. The goal of the research-based component is two-fold. First, it will provide critical data to support teachers throughout the endeavor. Second, it will inform publications, presentations, and adjustments for sustainability of the model after the PPD endeavor has concluded.
 - 4) The data analysis will occur throughout the year to inform the trajectory and strategy of implementation coupled with actionable steps to help teachers integrate the Instructional and Language Routines effectively in classrooms.
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5. End result.
Project the anticipated outcomes.

- 1) The first result and anticipated outcome of the project is a fundamental transition from the teachers. All involved in the project will experience student-centered pedagogical practices designed around capitalizing on students' conceptions of mathematics coupled with embracing student vocabulary to bridge between their understanding and unique wording to the formalized mathematics CCSS-M aligned curricula.
 - 2) The second is a partnership fostering community and support via all districts involved in the DTiR consortium, supporting each other in current endeavors to shift mathematical pedagogy from traditional lecture to multiple and strategically used Instructional and Language Routines to support equity of student voice during all mathematics lessons.
 - 3) The third is a shift in administrative expectations of current practices in mathematics classrooms. For the endeavor to succeed, teachers need support from their local and district level administrators. This support occurs most effectively when administrators understand what mathematics classrooms should look like under the new pedagogical arrangement.
 - 4) The fourth is publications and presentations sharing the results of the endeavor coupled with the influence on student achievement,
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student perceptions of mathematical ability, and student and teacher attitudes towards mathematics.

- 5) The fifth is the establishment of a multi-district consortium centered on equity and access for all students with the understanding that the greatest barrier to mathematical success is not inherent in the mathematical content, standards, concepts, or procedures but instead is inherent in the ways students have traditionally had to interact with the mathematics, the teachers, and each other.
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