

Supporting Teachers’ Appropriation of Ambitious Teaching Practice within the Context of Implementing Complex Multidimensional Science Assessments

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Project Goal

The project examines the situated implementation of the IMPACT PL and the ways in which the PL shapes teachers’ thinking and practice to enhance understanding of:



how and why it changes instruction for middle school science teachers

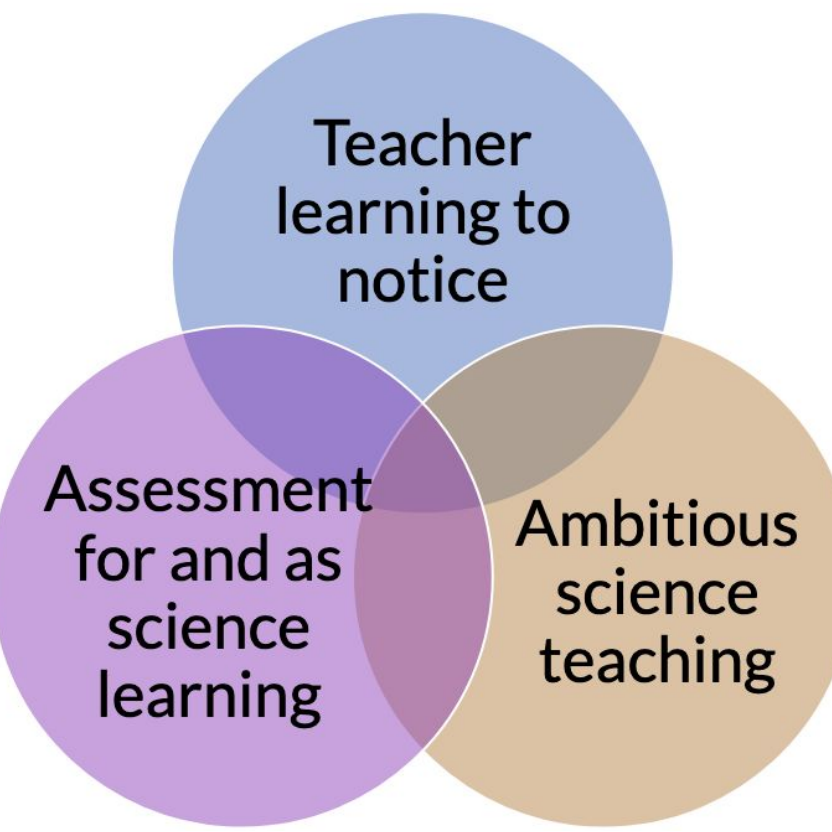


what it takes to support teachers in recognizing, engaging with, and building on students’ assets



the ways in which organizational structures and conditions intersect with the implementation of the PL model

Key Theoretical Approaches



Using PL focused on performance assessments as a high-leverage tool for supporting ambitious teaching in science

The Framework’s vision of science learning requires that teachers support students in generating, reflecting on, and advancing their ideas (NASEM, 2016). Instructionally embedded assessments are designed to make visible students’ 3D ideas as well as their interests, experiences, and cultural and language resources as they construct solutions to authentic and meaningful problems, but teachers need support with learning to notice and use these resources assets to deepen student learning (Banilower et al., 2018; Coffey et al., 2011; Heritage et al., 2007). Ambitious Science Teaching (AST) (Windschitl et al., 2018) offers a research-based toolkit for leveraging students’ assets, using them as building blocks for sensemaking.

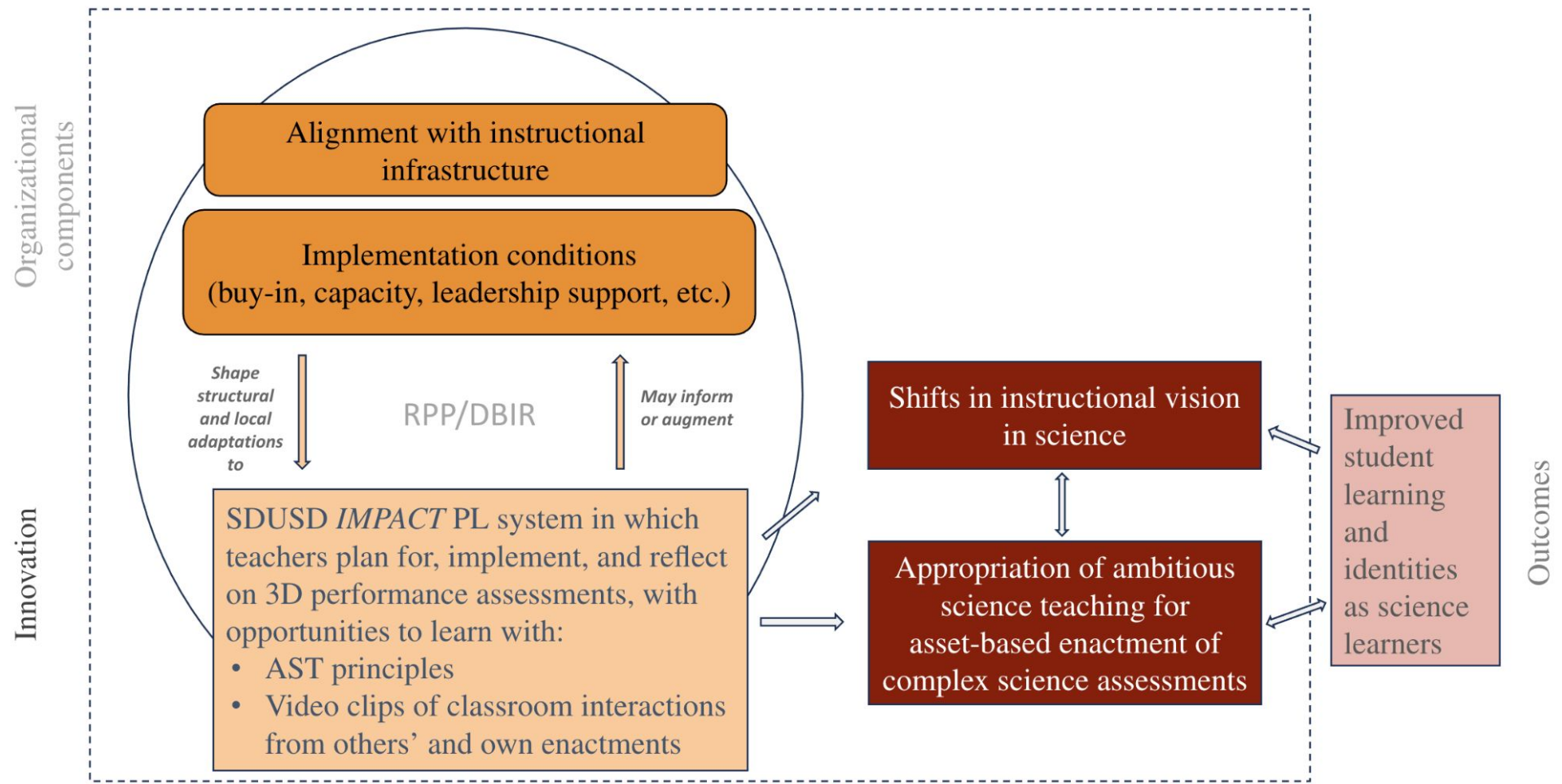
Engaging in a research-Practice partnership (RPP)

RPPs are long-term collaborations of researchers with teachers, district leaders, families, or communities, focused on mutualistic aims that address pressing needs and draw on the unique perspectives and expertise of all partners (e.g., Coburn & Penuel, 2016; Farrell et al., 2021). RPPs help to make innovations more usable, and thus support scaling and sustainability (Anderson & Shattuck, 2012). As partners invest in iterative design, evaluation, and refinement, situated investment and knowledge grow in ways that are not common when researchers introduce an innovation into school systems. By providing opportunities for researchers and educators to co-think and figure out how to make innovations fit the existing, and evolving, infrastructure, the RPP is central to our collaborative work in SDUSD.

Embedding PL in organizational contexts

Research on characteristics of effective PL (e.g., Darling-Hammond et al., 2017; Gare et al., 2001) and systemic improvement (e.g., Cobb et al., 2018; Penuel, 2019) have long pointed to the importance of integration of PL with classroom, school, and district contexts. The ways that the IMPACT PL complements, blends with, contradicts, or otherwise interacts with district and school instructional infrastructure and conditions matters significantly for impactful implementation; mechanisms by which improvement efforts *cultivate* alignment across these components and levels remain a critical area for ongoing study (e.g., Penuel, 2019; Stein & Coburn, 2023).

Conceptual Framework



We hypothesize that participation in the PL system will support shifts in teachers’ instructional vision and practice to improve student learning and students’ identities as science learners. Our focus for this project is on the components, processes, and mechanisms (within the dotted box) that influence these shifts.

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Implementation

Implementing Practices of Ambitious Teaching for Complex Assessment Tasks (IMPACT)

Instructionally-Embedded Performance Assessments

5-day discourse-rich performance assessments surface evidence of 3D performances for teachers to observe and attend to during the task.

Assessment Implementation PL Components

Analysis of video clips and student work from implementation of the assessment prepares teachers to notice students’ thinking and ways that AST principles can be used to work with students’ ideas.

IMPACT PL Structure

Practice-based PL surrounds each assessment to plan, then reflect on opportunities to surface and work with students’ ideas.

PL Implementation

PL is grade-based in a participant’s first year and continues as a school-based PLC in following years.

Research Questions

RQ 1: How does engaging in the SDUSD IMPACT PL system influence teachers’ appropriation of ambitious science teaching for asset-based enactment of complex science assessments?

1.a. How do students perceive their experiences during the implementation of assessments?

RQ 2: In what ways and to what extent do ambitious science teaching principles spread to instruction more broadly?

RQ 3: What aspects of the SDUSD IMPACT PL system drive teachers’ use of ambitious science teaching principles? How and why are these aspects consequential for their teaching?

RQ 4: In what ways do teachers’ instructional vision for enacting complex science assessments change, if at all, throughout their participation in the SDUSD IMPACT PL system?

RQ 5: As the SDUSD IMPACT PL system evolves and is embedded within school- and district-level structures, which components of the original IMPACT PL model remain stable, and which evolve or give rise to tensions? Under what school implementation conditions?

RQ 6: How does the SDUSD IMPACT PL system align with the district instructional infrastructure, and how does alignment evolve over time?

Plan for Data Collection

Data collection at the SDUSD IMPACT “PL system” level across all implementing schools:

- **IMPACT PL recordings, artifacts, and exit tickets**
- **Teacher surveys** focusing on teachers’ vision, practice, prior teaching and PL experiences, and teaching context
- **Teacher interviews** focusing on teachers’ instructional vision and practices, and use of assessments
- **Instructional logs** will capture instruction for 10 days in a row
- **Assessment-specific exit tickets** focusing on students’ experiences and perceived learning during assessments

Data collection at the “case study school” level from two case study schools over the course of the project:

- **PLC observations and artifacts** will focus on the PLC sessions led by district leaders at the school level
- **Classroom observations** focusing on teachers’ implementation of assessments and their typical instruction
- **Student interviews** (2-3 students in each teacher’s focal class) focusing on students’ experiences as science learners during the implementation of assessments
- **School administrator interviews** focusing on the school’s use of the IMPACT PL and assessments, and the general organizational conditions and context of the school

Data collection at the organizational level, focusing on the district and RPP leaders, whose work intersects with the IMPACT PL system implementation:

- **Project meeting observations and artifacts**
- **Interviews with district and RPP leaders** focusing on design and intent of IMPACT PL, local conditions and context, district’s vision, goals, and frameworks
- **Instructional infrastructure documents** such as instructional guidance frameworks, curricula, assessments, PL materials disseminated by the district