

Motivating Change: Meeting Teachers' Basic Needs in Science Professional Development

Brit Toven-Lindsey¹, Christine Lee Bae², Kathryn Hayes¹, Dawn O'Connor³

California State University East Bay ⁽¹⁾, Virginia Commonwealth University ⁽²⁾, Alameda County Office of Education ⁽³⁾



BACKGROUNDS & PURPOSE

Teacher professional development (PD) is important for supporting teachers' growth as educators. Key structures and design features of effective PD have been extensively studied (e.g., Desimone, 2009; Darling-Hammond et al., 2017; Garet et al., 2001; Kennedy, 2016).

Yet, supporting teachers in translating what is learned in PD to practice remains a challenge.

Less is known about **what happens during PD** and **explanatory mechanisms that facilitate teachers' motivation** to learn reform-based practices

Learner motivation in K12 and higher education has been extensively studied (e.g. Froiland & Worrell, 2016; Marshik et al., 2017; Nuñez & Leòn, 2019; Leòn et al., 2015; Ryan and Deci, 2020; Skinner et al., 2017).

Supporting learner motivation is important for student learning, engagement and wellness. Few studies consider how to support teachers' motivation as learners in professional development.

Purpose

The purpose of this study is to examine the **ways that PD facilitators (science faculty and pedagogical coaches) create conditions for teachers' intrinsic motivation as learners** in professional development.

RESEARCH SETTING

Science Learning Partnership (SLP; pseudonym)
Teacher PD focused on instructional and organizational capacity for elementary science

- 6 urban school districts in CA
- 3rd, 4th, and 5th grade teachers (N=150)

Participating teachers (self-reported):

- 23% more than one race; 21% Latinx; 9% Asian, Pacific Islander; 3% Black; 44% white
- 83% female

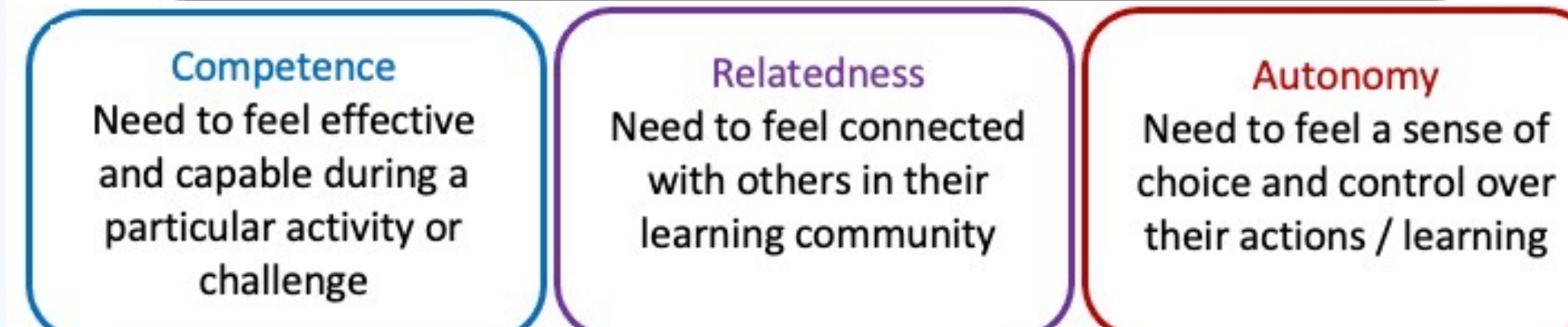
SLP Structure

- Summer Institute and Saturday Workshops
- Led by science faculty, coaches, and teacher leaders
- Integrated science content and pedagogy
- Reciprocal learning communities -- lesson study, action research
- District capacity building and individualized support

THEORETICAL FRAMEWORK

Self Determination Theory and Basic Psychological Needs

Intrinsic Motivation
Internally driven by enjoyment of a task or activity; alignment with personal interests and satisfaction



Intrinsic motivation is driven by personal interest, satisfaction and/or enjoyment with task or activity (Ryan & Deci, 2000; 2017)

Teachers will be more motivated to learn about NGSS and 3-dimensional science when strategies align with their goals/interests; belief that practices will positively impact student learning

Competence: feeling effective and capable during particular activity or given a specific challenge (not objective measure)

Relatedness: desire to feel connected with others in the learning community

Autonomy: volition / agency over one's approach to learning

METHODS

Data

Observational and interview data from formal PD sessions:

- Audio/video recordings, 70 hours of formal PD: 7 days, 3 grade-level cohorts
- 32 teacher interviews + open-ended responses from 3 PD feedback surveys

Analysis

- Multiple rounds of qualitative coding with three research team members (Maxwell, 2013; Saldana, 2012)
- Unit of analysis: facilitator moves, interactions between facilitators and teachers (unit of analysis)
- Organizational and theoretical categories based on SDT basic needs framework

SELECT RESULTS

PD Facilitator Moves	Excerpt Total	Teacher Perspectives on PD	Excerpt Total (Neg ex)
Competence	331		212 (23)
Positioning teachers as active learners	152	Active learning opportunities	92 (14)
Providing relevant, tangible resources	96	Tangible resources directly applicable to classroom	64 (5)
Recognizing teachers as experts; connecting to current practice	62		
Defining terms; science concepts, teaching moves	48	Building confidence with science content, pedagogical strategies	56 (4)
Providing meaningful feedback	22		

Competence: Flattening hierarchies & creating fluid 'expert'/'novice' roles

Based on codes: "Positioning teachers as active learners" + "Recognizing teachers as experts; connecting to their current practice"

PD Facilitator Moves:

- "You're going to become fourth grade students now. All right, take a breath, make the transition... we are going into kid mode..."
- "Thanks for sharing that, because that idea or that understanding actually [that you're sharing] serves as a resource for the other learners in the room. Many times, the thoughts we have, others also have, but they haven't expressed them... One thing I truly believe is that teaching and learning are difficult things to do, and that we do it best when we are constantly focusing on our practice and we get to do it with others."

Teachers' Perspectives on PD:

- "I was really glad that...I had the experience myself. And what surprised me, I guess by doing it myself, was how enjoyable it was. How easy it is even for adults to get engaged in something kind of surprising, mysterious, and hands-on. I was hoping the kids would be as interested in it as we were, and they were [when I taught the lesson]. So that made me very happy."

PD Facilitator Moves	Excerpt Total	Teacher Perspectives on PD	Excerpt Total (Neg ex)
Relatedness	248		89 (6)
Acknowledging / directly addressing teachers classroom context	106		
Leading with positive energy, humility	100	Feeling respected, appreciated in learning community	11
Building relationships among teachers; among facilitators and teachers	45	Sense of community with teacher colleagues and PD facilitators	19 (1)
Directly responding to teacher requests, needs	28		
Acknowledge school/district context	13	Contextual factors, competing priorities, constraints to implementing science PD is valuable, enjoyable	15*
			30 (1)

*Teachers comments about contextual factors were neither positive

PD Facilitator Moves	Excerpt Total	Teacher Perspectives on PD	Excerpt Total (Neg ex)
Autonomy	248		55 (4)
Meaningful rationale for activities and tasks	77		
Affirming teacher agency in implementation of PD strategies and pedagogies	56	PD supports choice/agency in implementing PD lessons, strategies	28 (2)
Articulating shared vision for reform science, goals of PD	49		
Dedicated time for teacher driven discourse	48	PD offers dedicated time for teacher driven discourse	12 (2)
Giving choice, differentiation re: learning needs	18		

DISCUSSION & IMPLICATIONS

Motivation is a well-established part of learning process, ownership and internalization of new ideas and strategies

- SDT and Basic Needs affords a new way of looking at teacher PD
- Moving beyond structural components of PD to consider **what is happening in this learning environment** (processes, underlying mechanisms) and **how teachers are experiencing the PD** is important to understanding teachers' motivation as learners
- Examining teacher motivation can shed new light on *how* and *why* teachers engage in learning and in turn implement new practices in their classroom

PD facilitators have an important role to play in supporting teachers' motivation as learners and meeting basic needs

- Positioning teachers as both learners and experts in PD community (competence)
- Providing teachers with tangible resources that are accessible and relevant to students (competence)
- Building community and relationships by recognizing teachers' classroom and school context (relatedness)
- Treating teachers as respected professionals by leading with humility, positivity and humor (relatedness)
- Creating space and dedicated time for teacher-led discourse and making sense of new ideas, pedagogies (autonomy)
- Encouraging teachers' sense of agency to implement new strategies from PD in their own classrooms to best meet their students needs (autonomy)

ACKNOWLEDGEMENTS

This material is based on research supported by the National Science Foundation under Discovery Research K12 (Grant #1813012).