Leadership for P3 Systems

Mike Brown & June Reineke | Early Learning Services

April 13th, 2023

Welcome to Leadership for P3 Systems!

Session Facilitators

- Mike Brown and June Reineke

Participants

- EC administrators, teachers

Overview

- What exactly is P3?
- Making sense of P3, *A new way of working*
- Development of the 7 Frames of P3
- State and national examples

Discussion #1: Learning and Development Across **Settings**

Think of the settings (homes, parks, schools/centers, friends, neighborhoods, etc.) where children experience the world.

- What are the places/settings that most impact children's learning and development? How?
- If we could impact these settings to enhance learning and development, what would we do?

Discussion #2: Learning and Development Across **Time**

Think of how children experience the world through time (i.e., as they get older).

- How does time impact children's learning and development?
- If we could impact children's experiences through time, especially those that would most enhance learning and development, what would we do? When would this occur?

The Big Picture of P3

is easy to grasp and support:

Improve quality and coherence across settings and through time.

However…

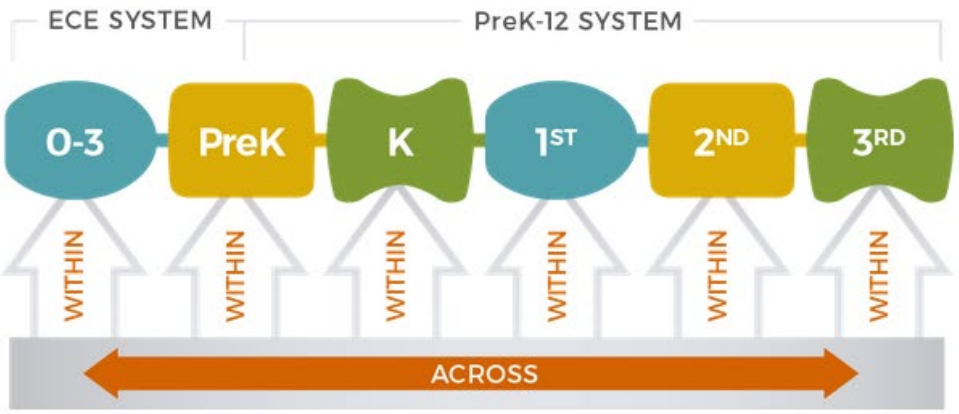
The Big Picture Consists of Several Pictures

1. P3 systems are about connections, with alignment and coherence as foundational tools.
   - The world gives us unlimited examples (supply chains, families, ecosystems, health, etc.).
2. P3 consists of both system building and system change. First and foremost, we have to understand the environments.
   - VHS to DVD to Digital or gas vehicles to electric (what were the conditions needed for this transition?)
   - Technology in school (what would have remote learning looked like if Covid happened before technology could support it? What students were left out due to barriers?)
   - As you think of education over the course of your career, what has changed?
3. We must understand current systems, structures, resources, etc.
   - What processes (e.g., resource flows, networks, improvement/goals), structures (e.g., governance, human capital, space, transportation, collective intelligence), and conditions (e.g., mindsets, resources, attention/energy, view of ECE) are needed to ensure P3 is successful? *Transformational*?
   - Are our current models designed to effectively deal with complexity and change? Several linear models?
4. The better we understand a problem, the better able we are to address it.
   - As educators, our tendency is to jump to problem solving and implementation.

What is P3?

What is P-3?

The vision for P-3 is to improve the quality and coherence of children's learning opportunities, from the experiences children have in early learning (including PreK, Head Start, child care, and other early learning opportunities before — or "pre" — formal entry into school) and extending through elementary school. At the Center, P-3 signifies both an age range and a lens for thinking about organization and system level change.



P-3 improves each age/grade level and aligns across them

Session Overview

1. Goal: Ensure Structures are in Place to Enable the Work
   - Focus on the conditions needed to support and enable the work.
   - Deepen understanding of P3 and P3 systems.
2. Getting started: The Seven Frames
3. Strategies and Examples

MDE's Regional Leadership Workshops 2018-19

"Pre-K through third grade is a new game—not another strategy or initiative—that requires a new way of working."

from New America Foundation

Goals: Ensuring Conditions are in Place

What environment are we building?

1. **Deepen understanding of P3, P3 work, and P3 systems.**
   - Establish and support a deep commitment to learning about systems.
   - Increase knowledge of your organization and other organizations that comprise the current P3 landscape. (parts of the whole)
2. **Develop collaborative P3 design elements/structures.**
   - Identify/develop a P3 workgroup or team, which includes cross-sector members.
   - Build collective vision, knowledge, and capacities.
3. **Learn about and develop core P3 elements, strategies, and processes.**
   - Learn by doing and Bias toward Action.
   - Build and sustain shared mental models of P3 in your program, organization, and community.
4. **Create/articulate a vision and start developing a P3 model.**
   - Articulate your vision and start thinking of a model that represents your P3 system approach.
   - Identify and strategize around leverage points in your system.

Sense-Making as Foundational to Deepening Understandings

"Sensemaking is a technique designed to aid our understanding of complex problems and conditions or environments. Sensemaking aids in developing stories around one's environment in which individuals and groups can begin developing shared mental models to understand the complex environment or problem better."

John R. Turner, Ph.D., Nigel Thurlow, and Brian 'Ponch' Rivera (2019). The Flow System Guide

The Role of Mapping, Modeling and Metaphor

- Using metaphor and analogies to help explain and deepen our understanding or “sensemaking” of P3 systems.
  - It’s not only about how well you understand P3, but also about how well those who comprise the systems understand P3. Achieving shared mental models.
  - Utilizing our understanding of other systems to deepen our understanding of P3.
- Mapping as a way to represent ideas, analyses, processes, systems, etc.
- Models are representations that can aid in defining, analyzing, and communicating a set of concepts. (from Sebok)
  - A **model** is an informative representation of an object, person or system. (from Wikipedia)
  - One goal of this course is to build/adopt a model to guide your work.

Mapping as Sense-Making Strategy

First, individuals gather data from various sources (e.g., their own histories, experiences, prior knowledge, beliefs, and the context in which they work) in order to explore the broader system and map the unfamiliar situation. Sense-making is a useful tool for people faced with a bewildering lack of information as it provides the necessary mapping technique. Maps clarify the ambiguous situation by illustrating, elucidating and inviting people to discuss the situation and contribute ideas in order to reach a clearer understanding and render their actions more effective.

Shared Sense-Making Processes, p. 3

LEADERSHIP AND POLICY IN SCHOOLS
https://doi.org/10.1080/15700763.2019.1696370

Routledge
Taylor & Francis Group

Check for updates

Shared Sense-Making Processes within a National Reform Implementation: Principals' Voices

Sherry Ganon-Shilon and Chen Schechter

School of Education, Bar-Ilan University, Ramat Gan, Israel

ABSTRACT

This qualitative study explores how 60 Israeli high school principals vary in their perceptions and enactments of shared sense-making processes while engaging in strategic activities to gain teachers' support during a national reform implementation. Data analysis has yielded three major themes: (a) a common language; (b) a collaborative learning process; and (c) a shared working culture. Leveraging a shared sense-making process can serve as a beneficial framework through which principals and faculty members collectively navigate complexity and uncertainty while implementing policy within their unique contexts. Theoretical and practical implications for faculty members and principals are suggested.

Education policies often press for rapid change, challenging schools to share knowledge within and across their boundaries to raise students' achievements (Coburn, Hill, & Spillane, 2016; Kalenze, 2014; Tran, McCormick, & Thu Nguyen, 2018). The implementation of education reforms requires "street-level bureaucrats", principals and their educational staff, to question collectively their common practices (Knapp & Feldman, 2012; Lipsky, 2010; Pietarinen, Pyhältö, & Soini, 2017). Challenging existing practices, school principals make sense of reform messages while engaging in interpretation and acting upon the dynamic interactions between internal and external demands. They have to maintain autonomy and responsibility to school staff (e.g., cater to teachers' needs, allocate time and resources and provide professional development support) on the one hand, while meeting accountability and standardization regulations of policymakers, district authorities, local council, and parents on the other hand (Louis & Robinson, 2012; Saltrick, 2010; Weick, 2009). Specifically, attaching a new meaning to their school practices while understanding and enacting reform mandates, principals influence teachers' sense-making process. Throughout this process, educators draw upon their own histories, experiences, prior knowledge, beliefs, and the context in which they are working to construct a shared meaning out of the new information they face (Ganon-Shilon & Schechter, 2017a; Coburn, 2016; Spillane & Anderson, 2014).

Research on educational policy suggests that pressure from the top-down serves as a catalyst for change yet cannot merely ensure effective reform implementation (Datnow & Park, 2009). Exploring implementation from a bottom-up aspect emphasizes a problem in the creation of policies, which is done in a haphazard manner, failing to take into account the importance of local contexts. This process of policy creation is often flawed, however there is a tendency to affix unfair blame on school principals and teachers who are tasked with reform implementation. This is a no-win situation for implementing agents who are placed at the forefront of reform efforts. In this sense, sense-making is particularly useful as it situates local actors (e.g., school principals and teachers) within their context, while highlighting the process by which their actions and settings shape policy implementation (Coburn, 2001).

CONTACT Sherry Ganon-Shilon sherryganon@yahoo.com The School of Education, Bar-Ilan University, Ramat-Gan, Israel, 52900

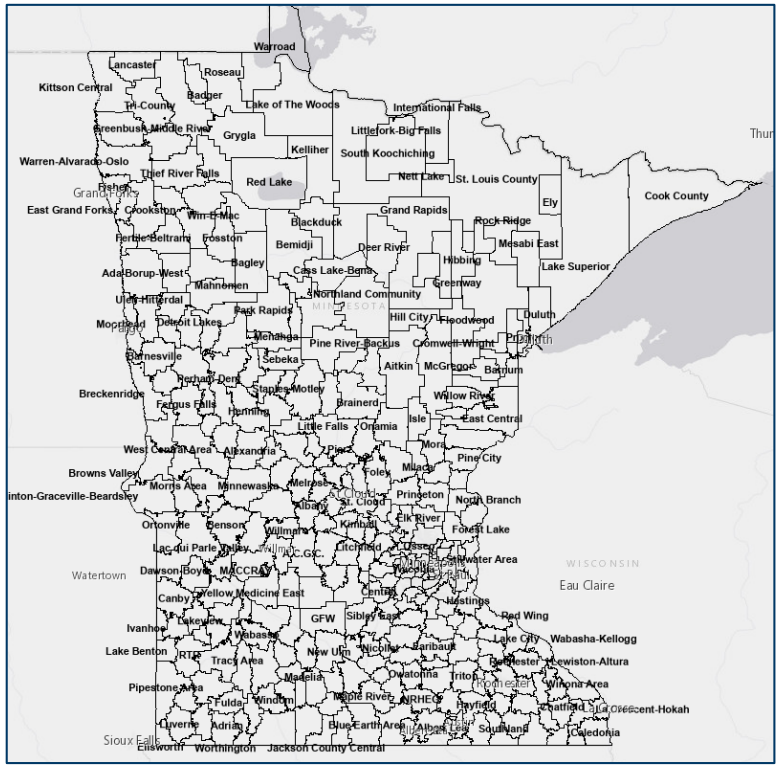
© 2019 Taylor & Francis Group, LLC

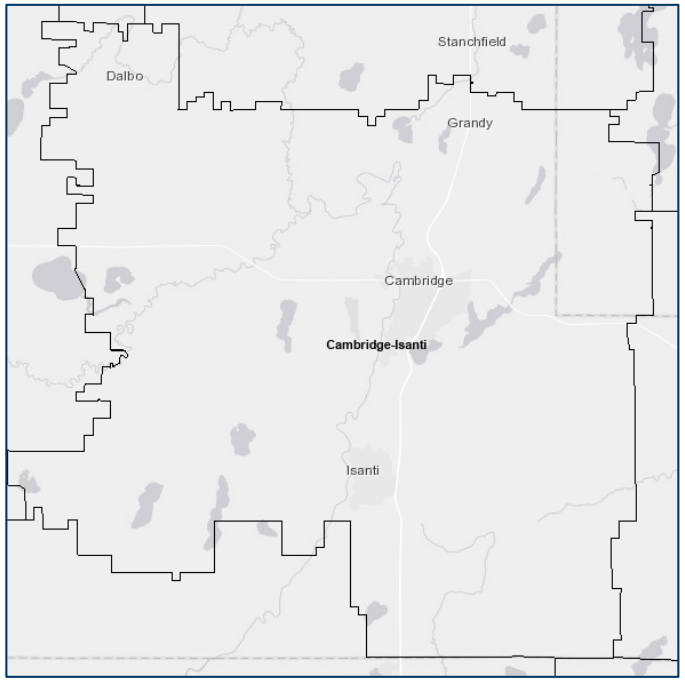
Maps and Mapping as a Tool

Mapping plays a foundational role throughout our P3 work.

For example:

- To help us “see” systems
- To help us understand systems (and create shared understandings).
- To help us analyze





[Minnesota Education Mapper]

Maps Help Us See

How well do we understand the environment?

Classroom (photo from Wikipedia)

School Photo from Northfield

Community Photo of Northfield from Nokomis Energy

Mapping Example: Curriculum

Curriculum Mapping Across the Disciplines: Differences, Approaches, and Strategies

Fiona Rawle, Tracey Bowen, Barbara Murck, and Rosa Junghwa Hong
University of Toronto Mississauga

DOI: 10.22329/celt.v10i0.4765

Curriculum mapping can be used to document, align, visualize, and assess curricular data, such as learning outcomes, assessment materials, instructional techniques, and student pre- and post-testing scores. A cross-disciplinary Curriculum Mapping Initiative currently underway at the University of Toronto Mississauga aims to: (1) develop guidelines for the curriculum mapping process; (2) develop cross-disciplinary curriculum mapping templates and samples to guide departments through the curriculum mapping process; (3) communicate narratives for how to use curriculum mapping to inform curricular change; (4) develop visualization strategies for curricular data; (5) initiate a plan for dissemination and sustainability; and (6) initiate a plan for informing students about how to use curricular maps in their academic experiences. Through this curriculum mapping initiative, we have discovered that discipline-specific differences exist in approaches to curriculum mapping. The purpose of this paper is to communicate these cross-disciplinary similarities and differences in purpose, process, and utilization of curriculum mapping strategies. We found that different departments had some common ground in the curriculum mapping process, but also key differences. The differences could be categorized according to: purpose for initiating the curriculum mapping process; approach to curriculum mapping; dissemination of completed maps; dealing with pedagogical jargon; and faculty buy-in.

Curriculum mapping is an active process for aligning student learning outcomes and curriculum activities (Kopera-Frye, Mahaffy, & Svare, 2008). Much has been written in the literature regarding the curriculum mapping process, especially in the medical and engineering disciplines (French, Shah, Rankin, Bagiati, & Breslow, 2012; Komenda et al., 2015). Curriculum mapping is often undertaken to assist with accreditation procedures (DeLuca & Bellara, 2013; Kelley, McAuley, Wallace, & Frank, 2008; Perlin, 2011), or for formalized curricular review and improvement (Veltri, Webb, Matveev, & Zapatero, 2011). Curriculum mapping can be used to map learning outcomes throughout a single course or across programs, to map course progression, to track both the teaching and assessment of student learning outcomes, or as part of the curricular alignment process (Lam & Tsui, 2013). Curriculum mapping can also be used to identify gaps (Lam & Tsui, 2013), and can lead to increased transparency (Harden, 2001).

75

Example of benefits:

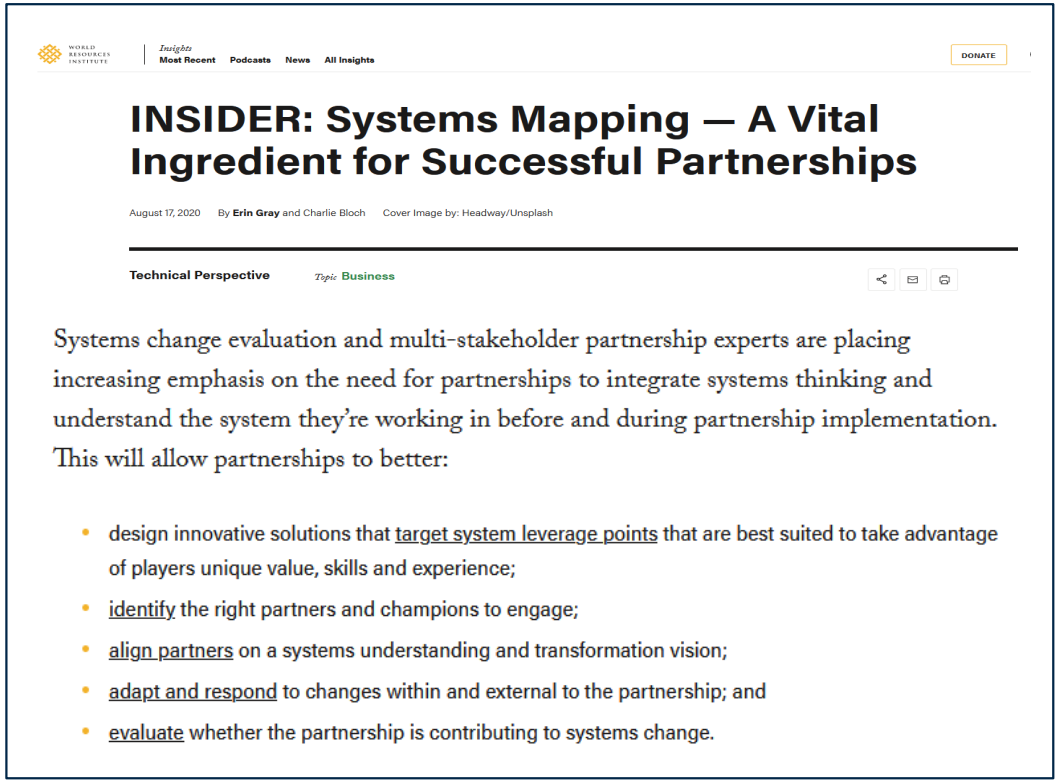
- All participating departments found the curriculum mapping process **fostered a collaborative approach** to discussing teaching and learning throughout the department.
- Curriculum mapping **leads to establishing more coherent progression** by bridging gaps between levels and courses.

Curriculum Mapping Across the Disciplines, p. 82

Systems Mapping Role

Systems mapping, which partnerships can use to understand the systems they're working on and align on a shared vision and strategy for change.

Broadly speaking, systems mapping is the creation of visual depictions of a system, such as its relationships and feedback loops, actors and trends. Systems mapping is intended to provide a simplified conceptual understanding of a complex system that, for collective action purposes, can get partners on the same page.



Insights
Most Recent Podcasts News All Insights
DONATE

INSIDER: Systems Mapping — A Vital Ingredient for Successful Partnerships

August 17, 2020 By **Erin Gray** and Charlie Bloch Cover Image by: Headway/Unsplash

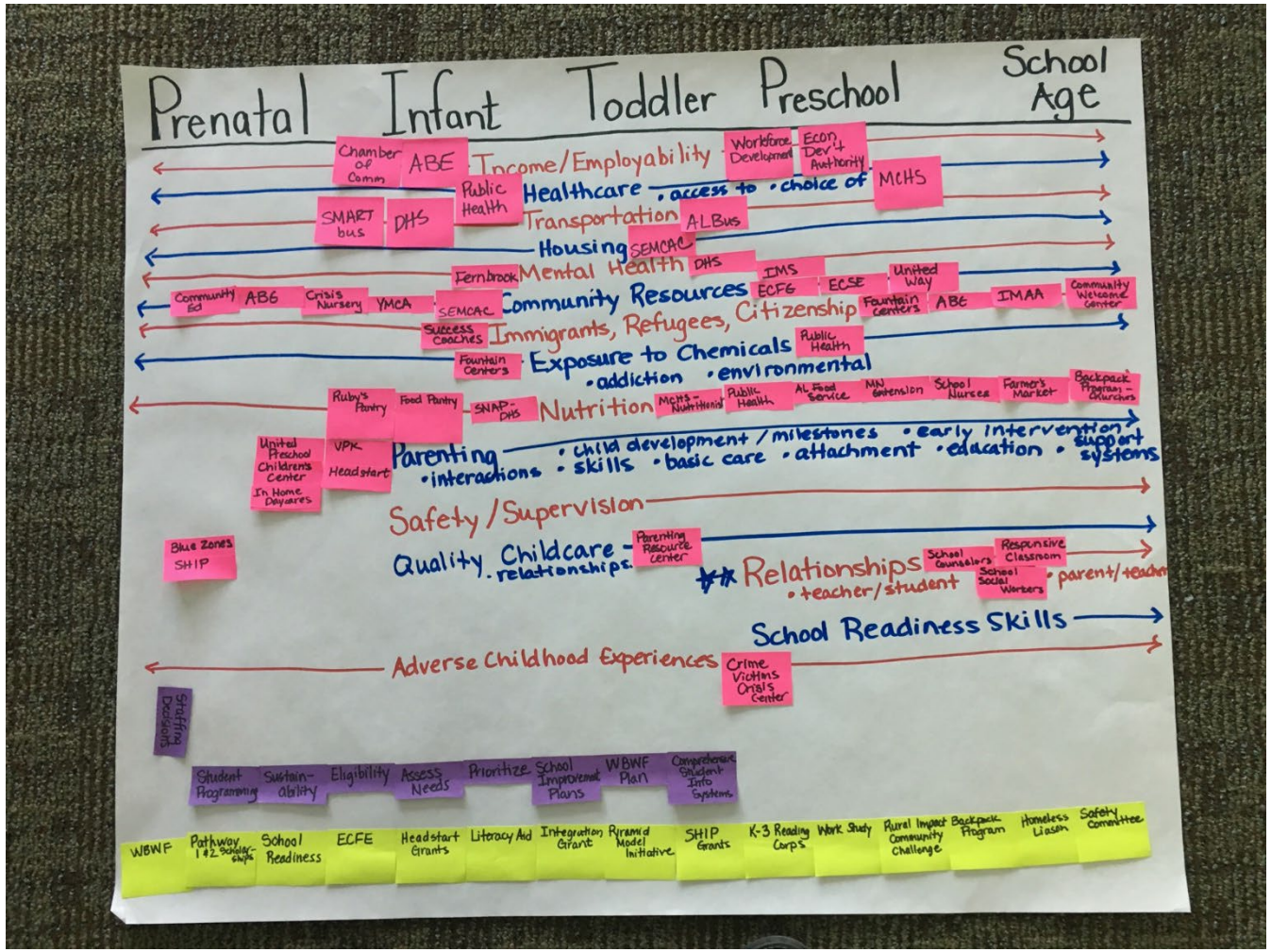
Technical Perspective *Topic* **Business**

Systems change evaluation and multi-stakeholder partnership experts are placing increasing emphasis on the need for partnerships to integrate systems thinking and understand the system they're working in before and during partnership implementation. This will allow partnerships to better:

- design innovative solutions that target system leverage points that are best suited to take advantage of players unique value, skills and experience;
- identify the right partners and champions to engage;
- align partners on a systems understanding and transformation vision;
- adapt and respond to changes within and external to the partnership; and
- evaluate whether the partnership is contributing to systems change.

from World Resources Institute

Example of Mapping from a P3 Workshop



"Show, don't tell"

Working together to map out systems builds shared understandings.

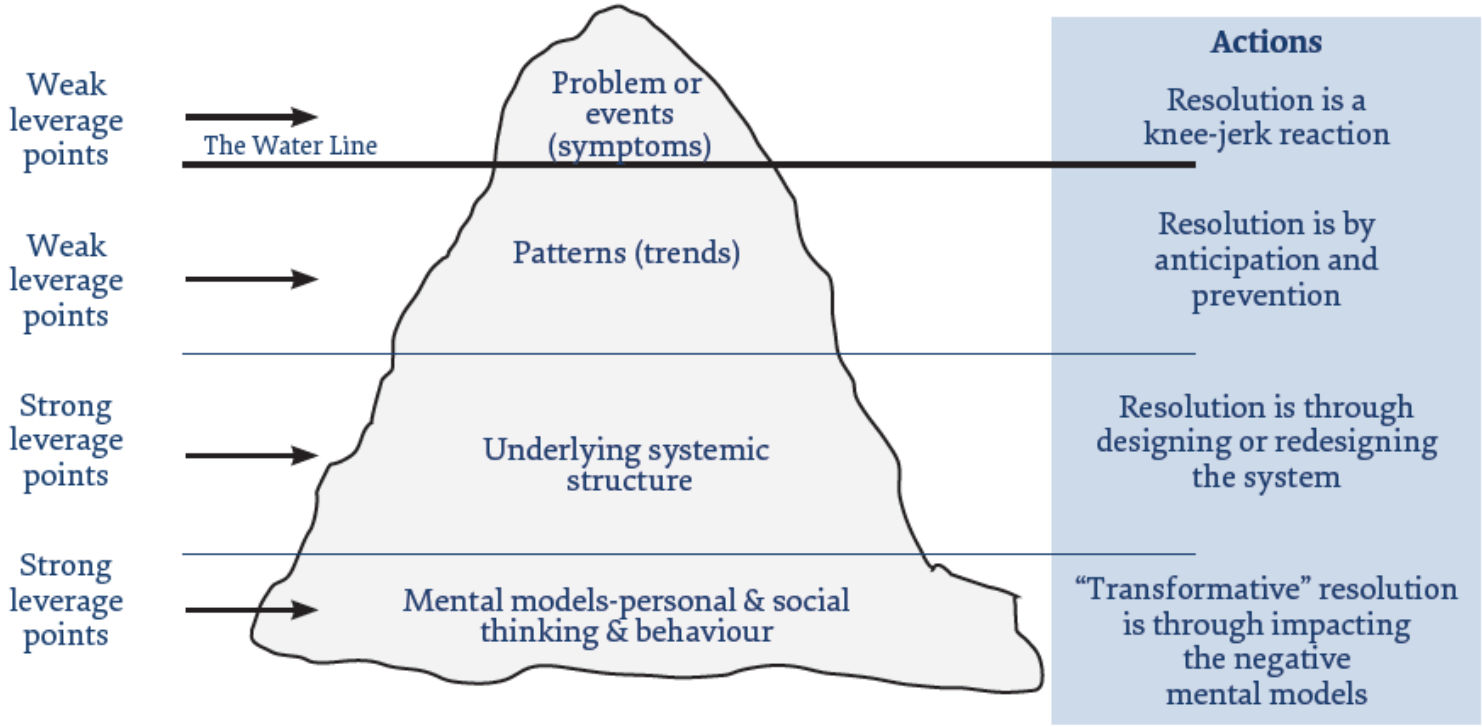
Mental Models *(before physical models – what we can't "see")*

Mental models include categories, concepts, identities, prototypes, stereotypes, causal narratives, and worldviews. Without mental models of the world it would be impossible for people to make most decisions in daily life. And without shared mental models, it would be impossible in many cases for people to develop institutions, solve collective action problems, feel a sense of belonging and solidarity, or even understand one another… Mental models provide us with default assumptions about the people we interact with and the situations we face. As a result, we may ignore information that violates our assumptions and automatically fill in missing information based on what our mental models suggest is likely to be true.

p. 328, *Shared Mental Models: Insights and Perspectives on Ideologies and Institutions*

Mental Models

Figure 1 The Iceberg Tool: Below the water line, one can notice patterns of behaviour enforced by the structure of the system and sustained by mental models.



from *A Systems Thinking Approach for Responding to the COVID-19 Pandemic*

Mapping, Metaphor, and Models help us:

- See the system in which we work, and in which children learn and develop.
- See the systems that impact our work.
- See the systems that impact children's learning and development.
- Develop shared understandings our roles (working in and transforming systems).
- Develop shared understandings of the nature and purpose of our P3 work.
- Work collaboratively with others to continuously align and work toward achieving coherence.

Session Overview

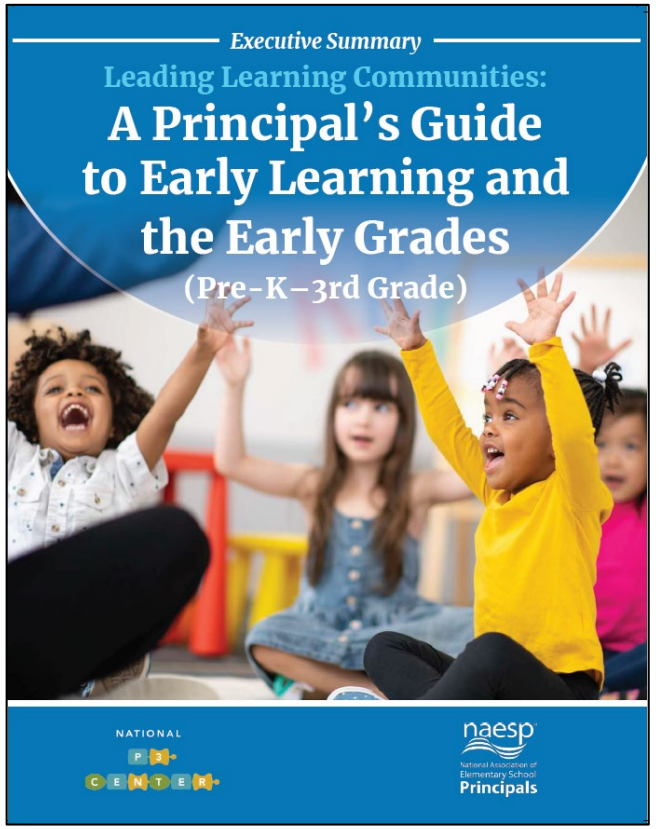
1. Goals of P3 Leadership: Ensure Structures are in Place to Support and Sustain the Work
2. Getting Started: The Seven Frames (framing your approach to P3)
   - Frame #1: Leadership Matters
   - Frame #2: Elevate and Embrace Early Education and Care
   - Frame #3: Commit to Building Shared Mental Models
   - Frame #4: Incorporate Core P3 Concepts into Everyday Practice
   - Frame #5: The Importance of Relationships
   - Frame #6: Commit to Continuous Learning and Improvement
   - Frame #7: Ensure Structures are in Place to Support and Sustain P3 Work
3. Strategies and Examples

Frame #1: **Leadership Matters**

Since the late 1990s, research began framing strong school leadership as a combination of three broad categories of leadership practices:

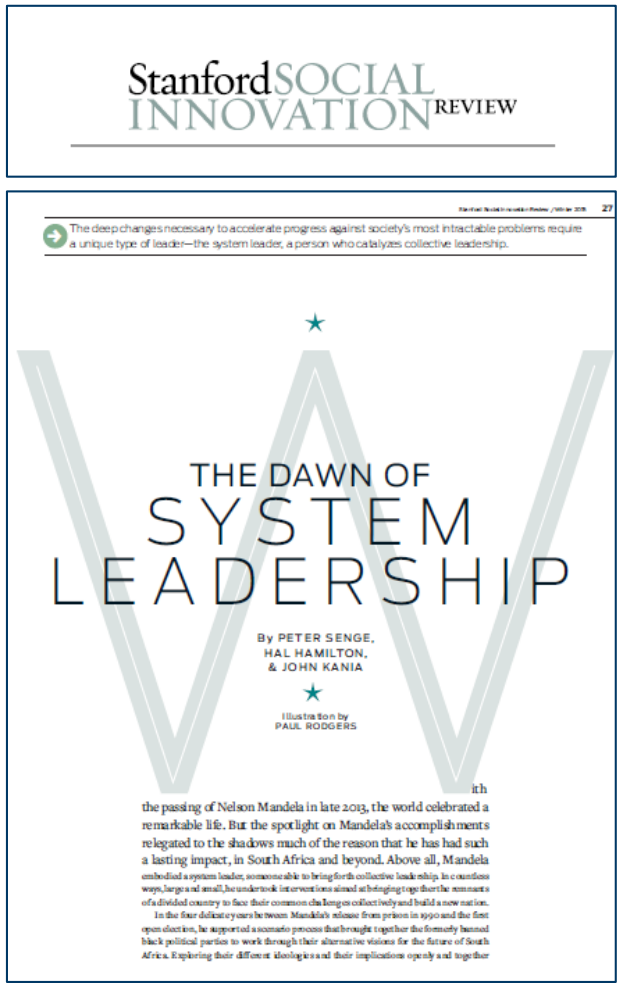
1. **Setting Direction/Vision**
2. **Developing People**
3. **Redesigning the Organization**

p. 13



NAESP Principal's Guide

P3 Work Requires Systems Leaders (system building)



Stanford SOCIAL INNOVATION REVIEW

The deep changes necessary to accelerate progress against society's most intractable problems require a unique type of leader—the system leader, a person who catalyzes collective leadership.

THE DAWN OF SYSTEM LEADERSHIP

By PETER SENGE, HAL HAMILTON, & JOHN KANIA

Illustration by PAUL RODGERS

With the passing of Nelson Mandela in late 2013, the world celebrated a remarkable life. But the spotlight on Mandela's accomplishments relegated to the shadows much of the reason that he has had such a lasting impact, in South Africa and beyond. Above all, Mandela embodied a system leader, someone able to bring forth collective leadership. In countless ways, large and small, he undertook interventions aimed at bringing together the remnants of a divided country to face their common challenges collectively and build a new nation.

In the four decisive years between Mandela's release from prison in 1990 and the first open election, he supported a scenario process that brought together the formerly banned black political parties to work through their alternative visions for the future of South Africa. Exploring their different ideologies and their implications openly and together

There are **three core capabilities** that system leaders develop in order **to foster collective leadership**:

1. The ability to see the larger system.
2. Fostering reflection and generative discussions.
3. Shifting the collective focus from reactive problem solving to co-creating the future.

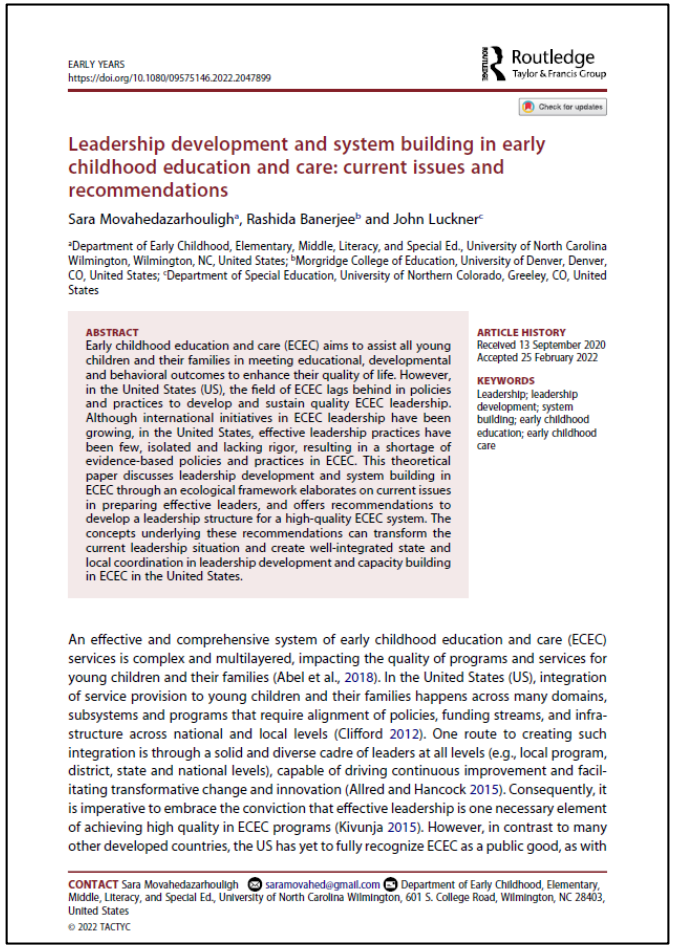
- from *The Dawn of System Leadership*

Leadership Development in Early Childhood Education

Building an effective ECEC leadership system is a journey, not a destination, requiring continuous attention and improvement through a comprehensive approach to ensure universally positive outcomes for all children. (p. 12)

An effective and comprehensive system of early childhood education and care (ECEC) services is complex and multilayered, impacting the quality of programs and services for young children and their families. (p. 1)

The delivery system remains fragmented, with uneven access, quality and affordability and a workforce that is as poorly unified as it is compensated. (p. 2)



EARLY YEARS
https://doi.org/10.1080/09575146.2022.2047899

Routledge
Taylor & Francis Group

Check for updates

Leadership development and system building in early childhood education and care: current issues and recommendations

Sara Movahedazarhouligh[a], Rashida Banerjee[b] and John Luckner[c]

[a]Department of Early Childhood, Elementary, Middle, Literacy, and Special Ed., University of North Carolina Wilmington, Wilmington, NC, United States; [b]Morgridge College of Education, University of Denver, Denver, CO, United States; [c]Department of Special Education, University of Northern Colorado, Greeley, CO, United States

ABSTRACT

Early childhood education and care (ECEC) aims to assist all young children and their families in meeting educational, developmental and behavioral outcomes to enhance their quality of life. However, in the United States (US), the field of ECEC lags behind in policies and practices to develop and sustain quality ECEC leadership. Although international initiatives in ECEC leadership have been growing, in the United States, effective leadership practices have been few, isolated and lacking rigor, resulting in a shortage of evidence-based policies and practices in ECEC. This theoretical paper discusses leadership development and system building in ECEC through an ecological framework elaborates on current issues in preparing effective leaders, and offers recommendations to develop a leadership structure for a high-quality ECEC system. The concepts underlying these recommendations can transform the current leadership situation and create well-integrated state and local coordination in leadership development and capacity building in ECEC in the United States.

ARTICLE HISTORY
Received 13 September 2020
Accepted 25 February 2022

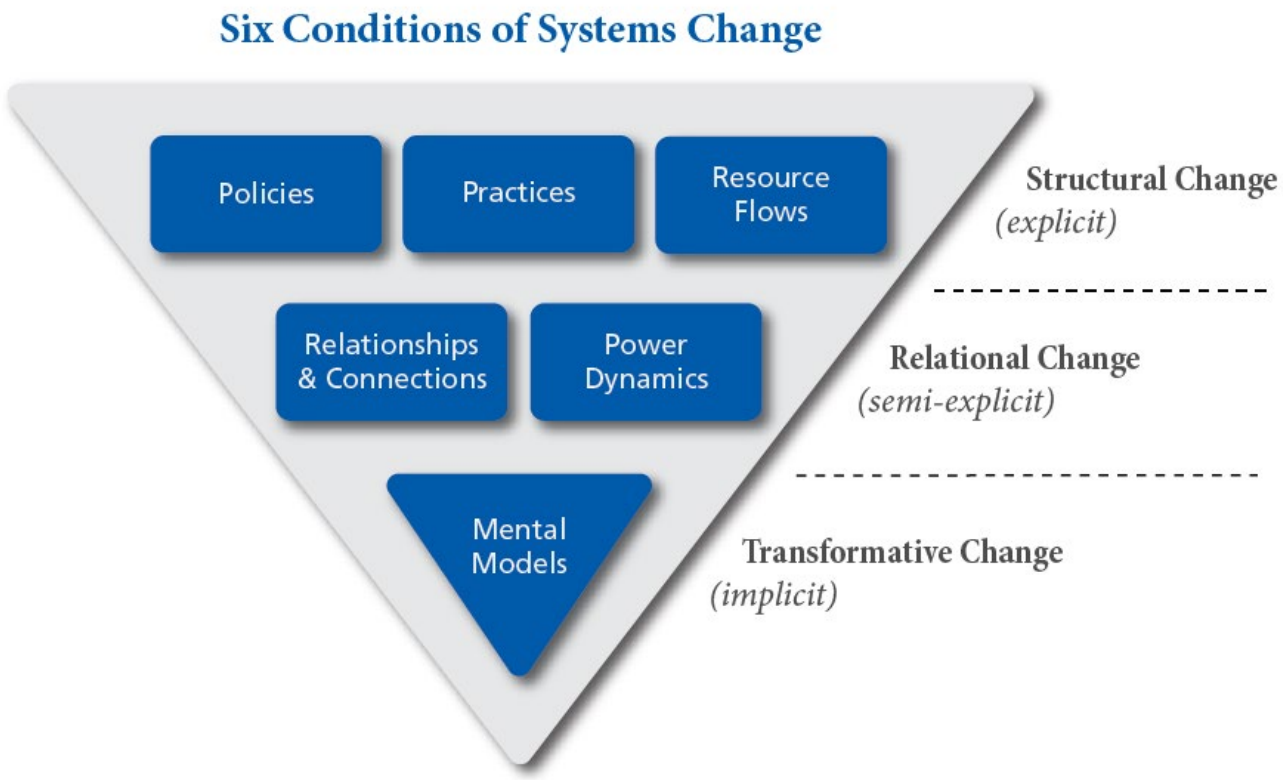
KEYWORDS
Leadership; leadership development; system building; early childhood education; early childhood care

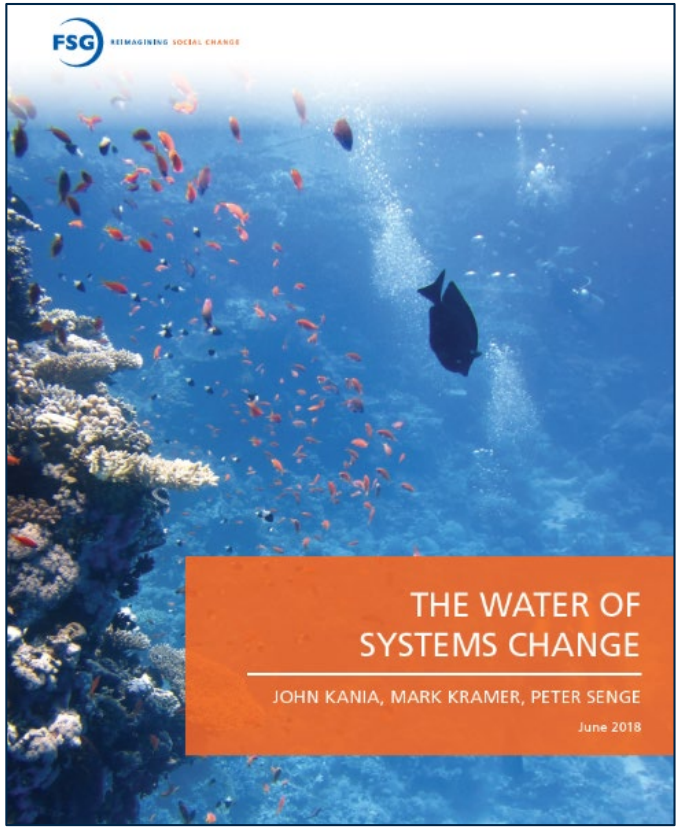
An effective and comprehensive system of early childhood education and care (ECEC) services is complex and multilayered, impacting the quality of programs and services for young children and their families (Abel et al., 2018). In the United States (US), integration of service provision to young children and their families happens across many domains, subsystems and programs that require alignment of policies, funding streams, and infrastructure across national and local levels (Clifford 2012). One route to creating such integration is through a solid and diverse cadre of leaders at all levels (e.g., local program, district, state and national levels), capable of driving continuous improvement and facilitating transformative change and innovation (Allred and Hancock 2015). Consequently, it is imperative to embrace the conviction that effective leadership is one necessary element of achieving high quality in ECEC programs (Kivunja 2015). However, in contrast to many other developed countries, the US has yet to fully recognize ECEC as a public good, as with

CONTACT Sara Movahedazarhouligh saramovahed@gmail.com Department of Early Childhood, Elementary, Middle, Literacy, and Special Ed., University of North Carolina Wilmington, 601 S. College Road, Wilmington, NC 28403, United States

© 2022 TACTYC

Leading for Change (transformational P3 systems)





[The Water Systems of Change]

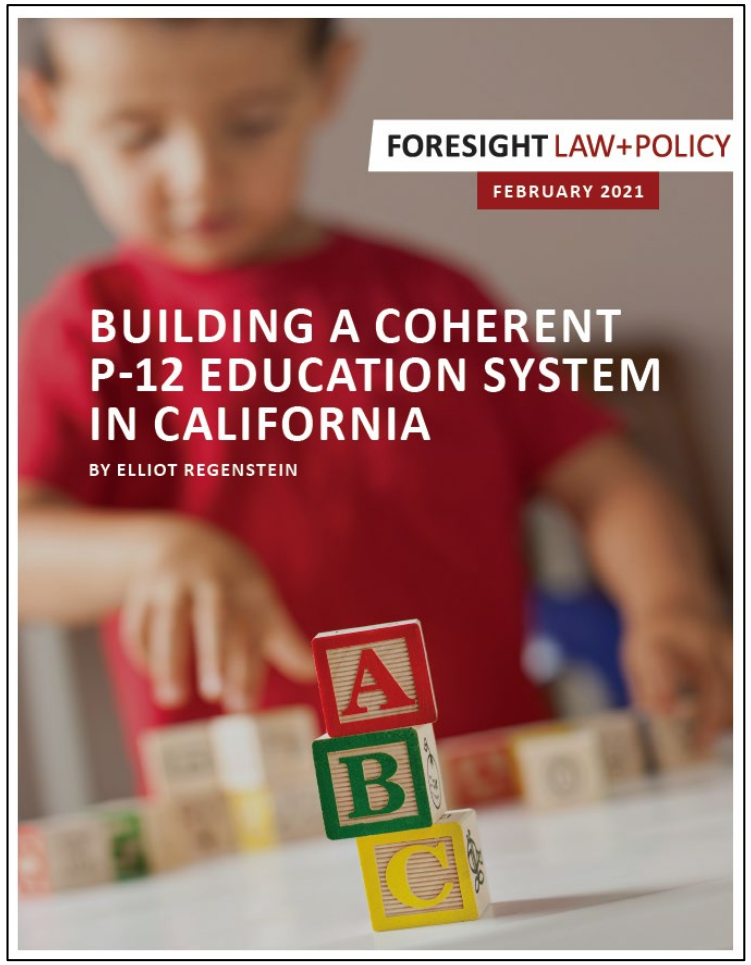
Frame #2: Elevate and Embrace Early Education and Care

"The birth-to-eight years offer our best opportunity to improve long-term outcomes. But as long as the relationship between K-12 and early learning remains broken, we will never take advantage of that opportunity at scale." p. 30

Key Points:

- If a cohort of students is not proficient it is hard to catch up.
  - In most districts, a cohort that is a year behind at the end of second grade is already looking at a potentially insurmountable hill to climb.
- A lot of students are behind by third grade.
- Catching up is less correlated to income than starting out behind.
- We have to start at the beginning.

Children Must Have a Strong Start



A Strong Start in the Early Years is Necessary for Success

There is a powerful difference between how **schools** are doing and how **students** are doing, and assessment data about California's school performance shows this quite clearly. In most instances school districts are doing the job they should be expected to do from third grade through the end of high school: helping students demonstrate a year's worth of academic growth every year. But the students in that time period may not be succeeding, because they were too far behind at the end of third grade to get caught up during the rest of their school career. *p. 35*

Building a Coherent P-12 System

P3 Leaders **Must** Understand the ECEC Infrastructure

Over the last two decades the federal government, states, and communities have all increased their commitment to early childhood, building on policy roots that go back decades further.

But the expansion of early childhood services has exposed a number of challenges with early childhood's policy infrastructure, including the fact that it is very difficult to create a real system from disparate programs sprinkled across multiple state and local agencies.

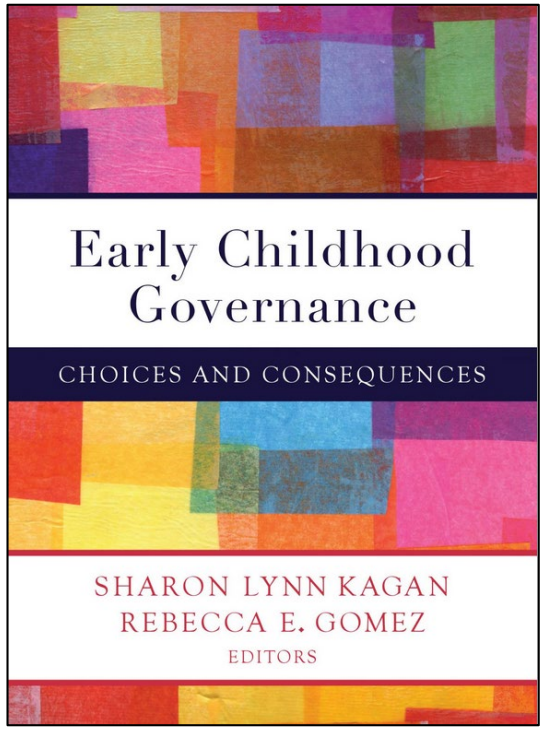
Policymakers and practitioners want a coherent, purpose-driven system — and the drive to create that system has made early childhood governance an ongoing focus for early childhood policymakers, administrators, advocates, and other stakeholders. p. 5

EC Governance: Getting There from Here

Work on Early Childhood Governance Right Away

- **Authority**: governance relates to ways in which authority is created and distributed (e.g. defining/producing of rules and actions and the granting of power).
- **Accountability**: the ways accountability is required (e.g., the verification of performance).
- **Durability**: the degree to which the entity that governs has durability.

p. 11



Early Childhood Governance

Start with Your Governance Structure

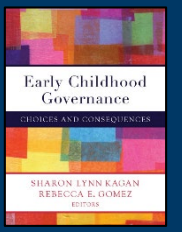
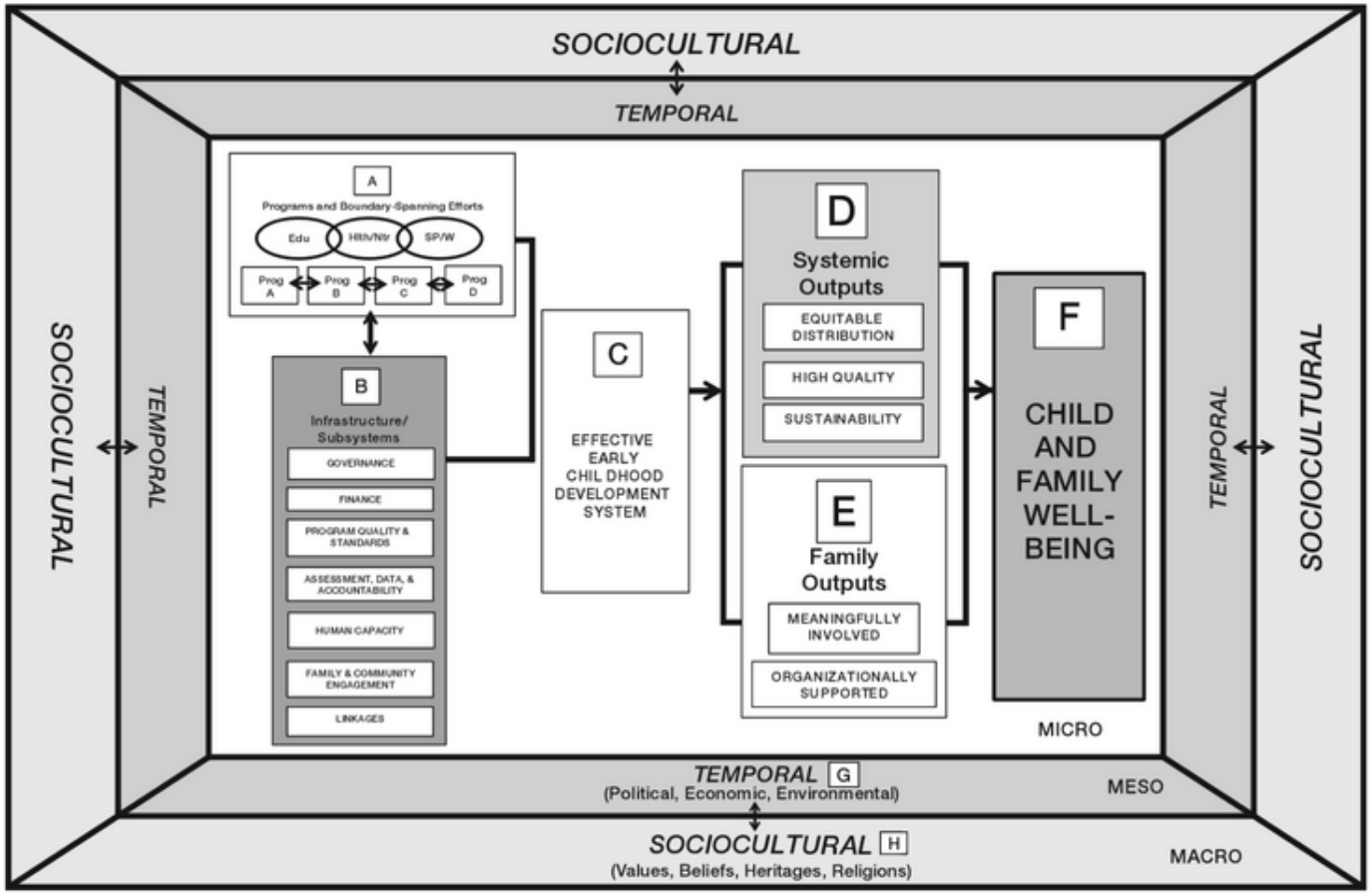


Figure 1.1. Conceptual Map

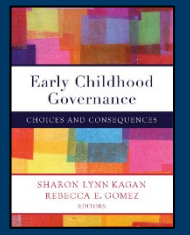


A Programs and services.

B Services are accompanied by a host of supports that comprise the infrastructure.

1. Governance
2. Finance
3. Program Quality & Standards
4. Assessment, Data, & Accountability
5. Human Capacity
6. Family and Community Engagement
7. Linkages with other institutions, including schools

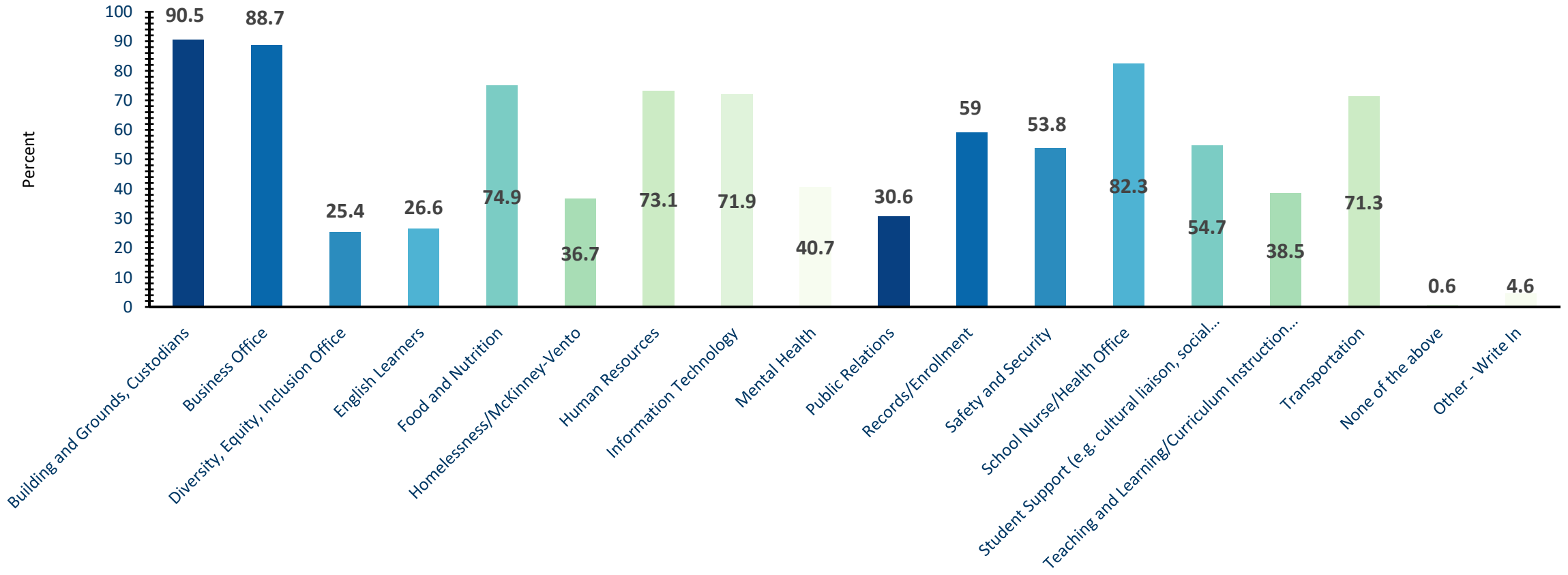
Five Key Governance Goals



- **Coordination:** The governance model should connect the parts and programs of the early childhood system, reflecting its comprehensive nature.
- **Alignment:** The model should provide coherence across systemwide tasks such as data collection, quality standards, and outcome measurement, and should break down silos associated with the administration of funding and the oversight of programs.
- **Sustainability:** The model should be able to sustain political and administrative changes.
- **Efficiency:** The model should allocate resources wisely, reduce duplication of effort, and provide a significant return on investment
- **Accountability:** The model should be accountable to the EC system and its stakeholders in terms of quality, equality, and outcomes and also should be able to hold services and program accountable for their performance. p. 37

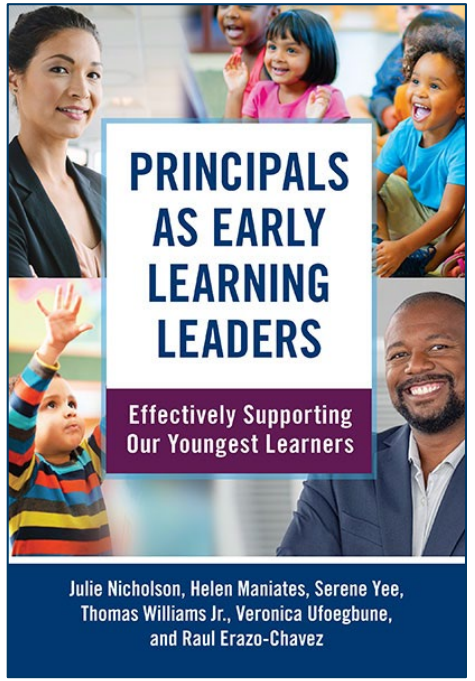
Alignment of Organizational Supports in Minnesota

2022 EC Policy Survey: As a lead early childhood administrator in the district, which of the following roles are you able to rely on to support your efforts?



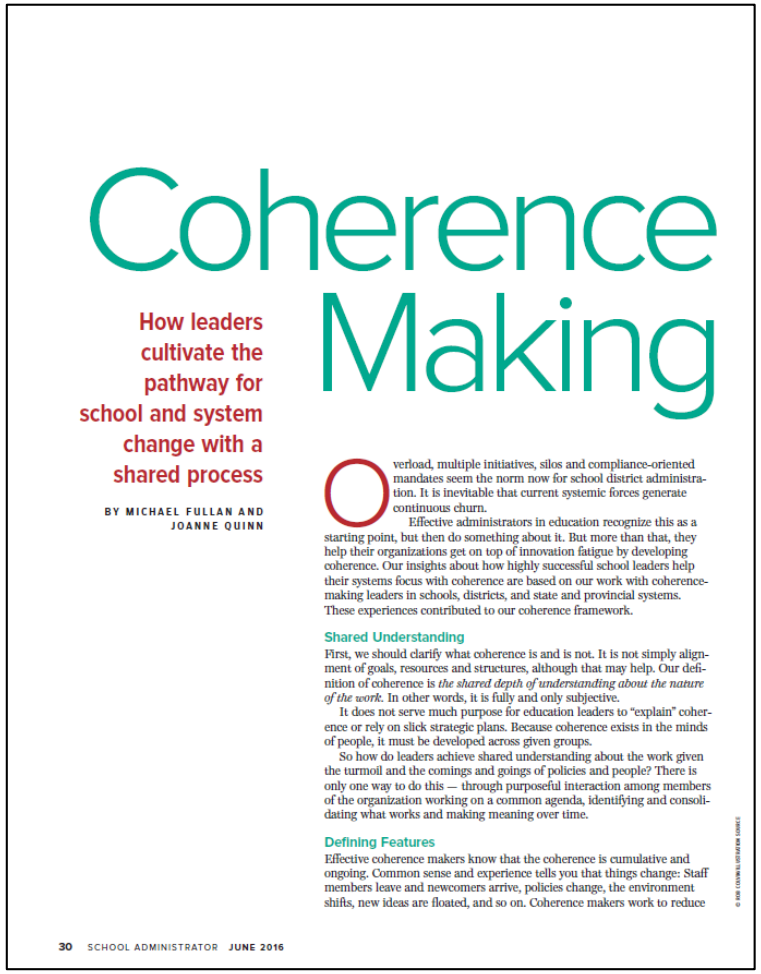
Frame #3: Commit to Building Shared Mental Models

- Sense-making, shared understandings
- The “why” and “what” of P3.
- Inclusion and understanding.
  - Terminology, professional/technical language, etc.
  - Roles (do people understand their role in P3 systems?)
- The context of the work.
- Direction versus destination.
  - Vision (*seeing together);* visionary



Principals as EL Leaders

Coherence Making – Fullan and Quinn



Coherence Making

How leaders cultivate the pathway for school and system change with a shared process

BY MICHAEL FULLAN AND JOANNE QUINN

Overload, multiple initiatives, silos and compliance-oriented mandates seem the norm now for school district administration. It is inevitable that current systemic forces generate continuous churn.

Effective administrators in education recognize this as a starting point, but then do something about it. But more than that, they help their organizations get on top of innovation fatigue by developing coherence. Our insights about how highly successful school leaders help their systems focus with coherence are based on our work with coherence-making leaders in schools, districts, and state and provincial systems. These experiences contributed to our coherence framework.

Shared Understanding

First, we should clarify what coherence is and is not. It is not simply alignment of goals, resources and structures, although that may help. Our definition of coherence is *the shared depth of understanding about the nature of the work*. In other words, it is fully and only subjective.

It does not serve much purpose for education leaders to "explain" coherence or rely on slick strategic plans. Because coherence exists in the minds of people, it must be developed across given groups.

So how do leaders achieve shared understanding about the work given the turmoil and the comings and goings of policies and people? There is only one way to do this — through purposeful interaction among members of the organization working on a common agenda, identifying and consolidating what works and making meaning over time.

Defining Features

Effective coherence makers know that the coherence is cumulative and ongoing. Common sense and experience tells you that things change: Staff members leave and newcomers arrive, policies change, the environment shifts, new ideas are floated, and so on. Coherence makers work to reduce

30 SCHOOL ADMINISTRATOR JUNE 2016

- Our definition of coherence is *the shared depth of understanding about the nature of the work.*
- Because coherence exists in the minds of people, it must be developed across given groups.

How to achieve shared understanding?

- There is only one way to do this — through purposeful interaction among members of the organization working on a common agenda, identifying and consolidating what works and making meaning over time.

Coherence Making, *School Administrator*, June 2016

Building Shared Understanding

Building Shared Understanding Through System Mapping

by Jeff Mohr

Share

As part of recent efforts to improve the quality of outcomes for Hawaii's youngest children, Scott Spann was contracted by Collaborative Leaders Network to lead a diverse group of 80+ public and private stakeholders through a system mapping process. This collaborative process was designed to build both shared reality and shared understanding among the stakeholders, enabling them to collaborate and agree upon common priorities. These priorities shaped a statewide strategy for early childhood over the next 3–5 years. In the two-part piece below, Scott walks through the process undertaken to lead the group through the system mapping effort.

Hawaii Early Childhood Action Strategy

This collaborative process was designed to build both shared reality and shared understanding among the stakeholders, enabling them to collaborate and agree upon common priorities.

Collaborative Leaders Network

Example: Shared Understanding in Data

According to our theory of collaboration, the goal of communication in statistics and data science collaborations is to create shared understanding. Furthermore, *shared understanding is the basis for action toward making a deep contribution in the domain of application and is a process by which relationships are strengthened*.

Shared understanding is the result of a multistep process by which information/facts about a project are exchanged between parties, common knowledge of these facts is established, and the relevance and usefulness of the facts to achieve the goals of the collaboration also becomes common knowledge. p. 55

JOURNAL OF STATISTICS AND DATA SCIENCE EDUCATION
2022, VOL. 30, NO. 1, 54–64
https://doi.org/10.1080/26939169.2022.2035286

Taylor & Francis

OPEN ACCESS

Creating Shared Understanding in Statistics and Data Science Collaborations

Eric A. Vance[a], Jessica L. Alzen[a], and Heather S. Smith[c]

[a]Laboratory for Interdisciplinary Statistical Analysis, Department of Applied Mathematics, University of Colorado Boulder, Boulder, CO; [b]Center for Assessment, Design, Research, and Evaluation, School of Education, University of Colorado Boulder, Boulder, CO; [c]Department of Statistics, California Polytechnic State University, San Luis Obispo, CA

ABSTRACT

Statisticians and data scientists have been called upon to increase the impact they have through their collaborative projects. Statistics and data science practitioners and their educators can achieve and enable greater impact by learning how to create shared understanding with their collaborators as well as teaching this concept to their students, colleagues, and mentees. In this article, we explore and explain the concepts of common knowledge and shared understanding, which is the basis for action to accomplish greater impacts. We also explore related concepts of misunderstanding and doubtful understanding. We describe a process for teaching oneself and others how to create shared understanding. We conclude that incorporating the concept of shared understanding into one's practice of statistics or data science and following the steps described will result in having more impact on projects and throughout one's career.

KEYWORDS

Common knowledge; Communication; Consulting; Doubtful understanding; Statistical practice; Statistics education

1. Introduction

Throughout the years, many have called for statisticians to develop their communication and collaboration skills so that they can work more closely with clients/domain experts and thereby increase their impact. Ram Gnanadesiken, the 1989 President of the Institute of Mathematical Statistics said, "Cross-disciplinary interactions …are means of justifying the relevance and indeed the reason for existence of statistics," (1990, p. 122) and, "We need a switch turned on, a value established, for impelling statisticians to be challenged intellectually and through a desire to contribute to solving major problems in other fields" (1990, p. 124). Peter Lachenbruch, in his American Statistical Association (ASA) Presidential Address stated: "We need to work with statisticians to improve their skills as ambassadors to nonstatisticians and colleagues, so that they can communicate statistical ideas to other statisticians, to nonstatistical professionals (clients), to the public, and to the media" (2009, p. 1). Ron Wasserstein, the current ASA Executive Director stated, "We must increase the visibility of our profession" (2015, p. 96) and that increasing the visibility of statistics and data science requires speaking "freely and definitively about the power and impact of statistics and its key role in decision-making" (2015, p. 98).

Following this logic, Olubusoye, Akintande, and Vance (2021) states that statisticians and data scientists should—in addition to communicating *findings* and *conclusions* based on analyses of data—also collaborate with domain experts to produce *recommendations for action* and create plans for implementing these recommendations to transform evidence into action. Vance and Love (2021) describes lessons learned from the global LISA 2020 Network about transforming evidence into action. We believe that it is through action in collaboration with domain experts that statisticians and data scientists will achieve impact.

How statisticians and data scientists are to impel others to act to achieve positive impact and how to teach this skill are still open questions. Janice Derr motivates her book *Statistical Consulting: A Guide to Effective Communication* by stating: "The extent to which your client understands and accepts your recommendation also depends on your communication skills. This is why we say that skills in communication are *enabling* skills; they enable you to make the best use of your expertise in statistics" (2000, p. 2). Also according to Derr, gathering accurate and complete information about the technical nature of a client's project (i.e., *understanding*) is one of the key tasks in statistical consulting (2000). One way for a statistician to progress along the path from consulting to collaboration to leadership is to elevate the notion of *understanding* the facts of a project to an understanding of their context so as to make an impact on the project or client organization (Love et al. 2017). Vance (2015) calls on academic consulting centers and collaboration laboratories to focus on educating and training students to increase their impacts, but does not identify specific ways for doing so.

This article attempts to address this gap. Based on our more than 50 years of experience collaborating with domain experts, we believe that *shared understanding* is the basis for *action* and that statistics and data science educators can teach students and

CONTACT Eric A. Vance Eric.Vance@Colorado.EDU Laboratory for Interdisciplinary Statistical Analysis, Department of Applied Mathematics, University of Colorado Boulder, 1111 Engineering Drive, Boulder, CO 80309.

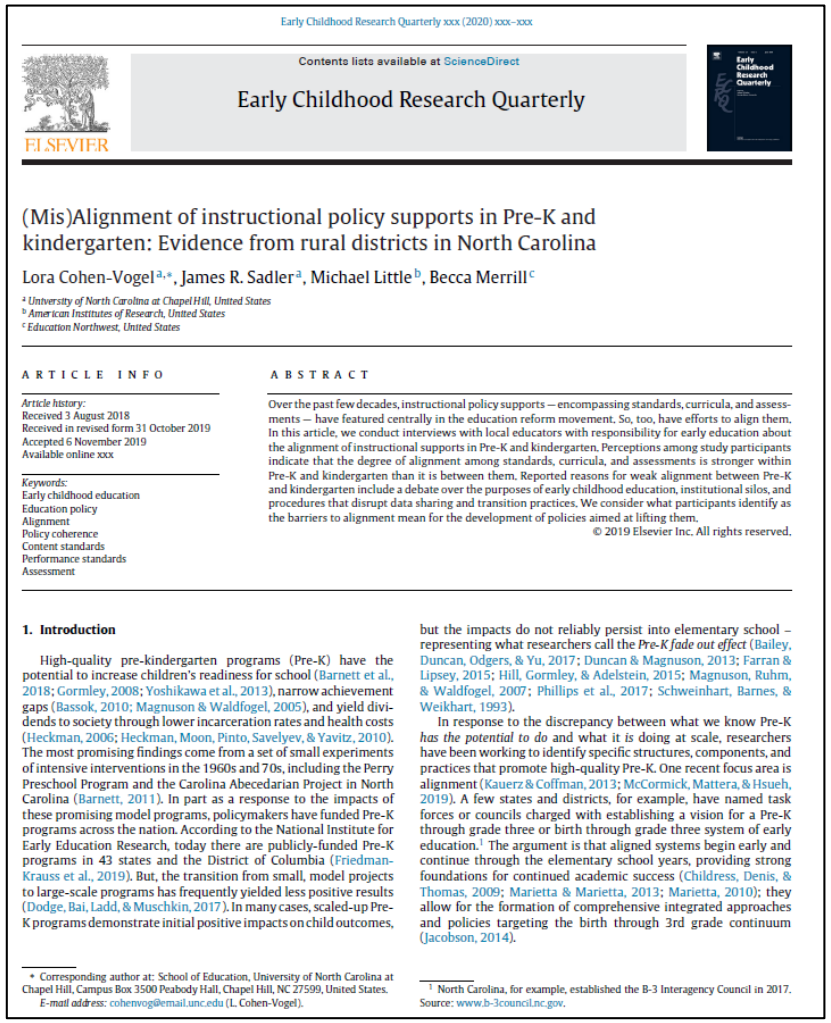
© 2022 The Author(s). Published with license by Taylor and Francis Group, LLC.
This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The moral rights of the named author(s) have been asserted.

Shared Understanding

Coherence is a term used to refer to policies that link together to direct a system as a whole. Coherence means 'having the quality of holding together as a firm mass' and being 'logically consistent.' Coherent policies are congruent, send the same messages, and avoid contradictions. As applied to education, coherent policies establish goals about what students should know and be able to do and then coordinate other policies that link to these goals.

p. 3

Coherence takes two dominant forms. **Horizontal alignment** refers to the degree of alignment between policies within a grade level. **Vertical alignment** refers to the degree of alignment among policies across grade levels.



Early Childhood Research Quarterly xxx (2020) xxx–xxx

Contents lists available at ScienceDirect

Early Childhood Research Quarterly

(Mis)Alignment of instructional policy supports in Pre-K and kindergarten: Evidence from rural districts in North Carolina

Lora Cohen-Vogel[a,*], James R. Sadler[a], Michael Little[b], Becca Merrill[c]

[a] University of North Carolina at Chapel Hill, United States
[b] American Institutes of Research, United States
[c] Education Northwest, United States

ARTICLE INFO

Article history:
Received 3 August 2018
Received in revised form 31 October 2019
Accepted 6 November 2019
Available online xxx

Keywords:
Early childhood education
Education policy
Alignment
Policy coherence
Content standards
Performance standards
Assessment

ABSTRACT

Over the past few decades, instructional policy supports — encompassing standards, curricula, and assessments — have featured centrally in the education reform movement. So, too, have efforts to align them. In this article, we conduct interviews with local educators with responsibility for early education about the alignment of instructional supports in Pre-K and kindergarten. Perceptions among study participants indicate that the degree of alignment among standards, curricula, and assessments is stronger within Pre-K and kindergarten than it is between them. Reported reasons for weak alignment between Pre-K and kindergarten include a debate over the purposes of early childhood education, institutional silos, and procedures that disrupt data sharing and transition practices. We consider what participants identify as the barriers to alignment mean for the development of policies aimed at lifting them.

© 2019 Elsevier Inc. All rights reserved.

1. Introduction

High-quality pre-kindergarten programs (Pre-K) have the potential to increase children's readiness for school (Barnett et al., 2018; Gormley, 2008; Yoshikawa et al., 2013), narrow achievement gaps (Bassok, 2010; Magnuson & Waldfogel, 2005), and yield dividends to society through lower incarceration rates and health costs (Heckman, 2006; Heckman, Moon, Pinto, Savelyev, & Yavitz, 2010). The most promising findings come from a set of small experiments of intensive interventions in the 1960s and 70s, including the Perry Preschool Program and the Carolina Abecedarian Project in North Carolina (Barnett, 2011). In part as a response to the impacts of these promising model programs, policymakers have funded Pre-K programs across the nation. According to the National Institute for Early Education Research, today there are publicly-funded Pre-K programs in 43 states and the District of Columbia (Friedman-Krauss et al., 2019). But, the transition from small, model projects to large-scale programs has frequently yielded less positive results (Dodge, Bai, Ladd, & Muschkin, 2017). In many cases, scaled-up Pre-K programs demonstrate initial positive impacts on child outcomes, but the impacts do not reliably persist into elementary school – representing what researchers call the *Pre-K fade out effect* (Bailey, Duncan, Odgers, & Yu, 2017; Duncan & Magnuson, 2013; Farran & Lipsey, 2015; Hill, Gormley, & Adelstein, 2015; Magnuson, Ruhm, & Waldfogel, 2007; Phillips et al., 2017; Schweinhart, Barnes, & Weikhart, 1993).

In response to the discrepancy between what we know Pre-K *has the potential to do* and what it *is* doing at scale, researchers have been working to identify specific structures, components, and practices that promote high-quality Pre-K. One recent focus area is alignment (Kauerz & Coffman, 2013; McCormick, Mattera, & Hsueh, 2019). A few states and districts, for example, have named task forces or councils charged with establishing a vision for a Pre-K through grade three or birth through grade three system of early education.[1] The argument is that aligned systems begin early and continue through the elementary school years, providing strong foundations for continued academic success (Childress, Denis, & Thomas, 2009; Marietta & Marietta, 2013; Marietta, 2010); they allow for the formation of comprehensive integrated approaches and policies targeting the birth through 3rd grade continuum (Jacobson, 2014).

* Corresponding author at: School of Education, University of North Carolina at Chapel Hill, Campus Box 3500 Peabody Hall, Chapel Hill, NC 27599, United States.
E-mail address: cohenvog@email.unc.edu (L. Cohen-Vogel).

[1] North Carolina, for example, established the B-3 Interagency Council in 2017. Source: www.b-3council.nc.gov.

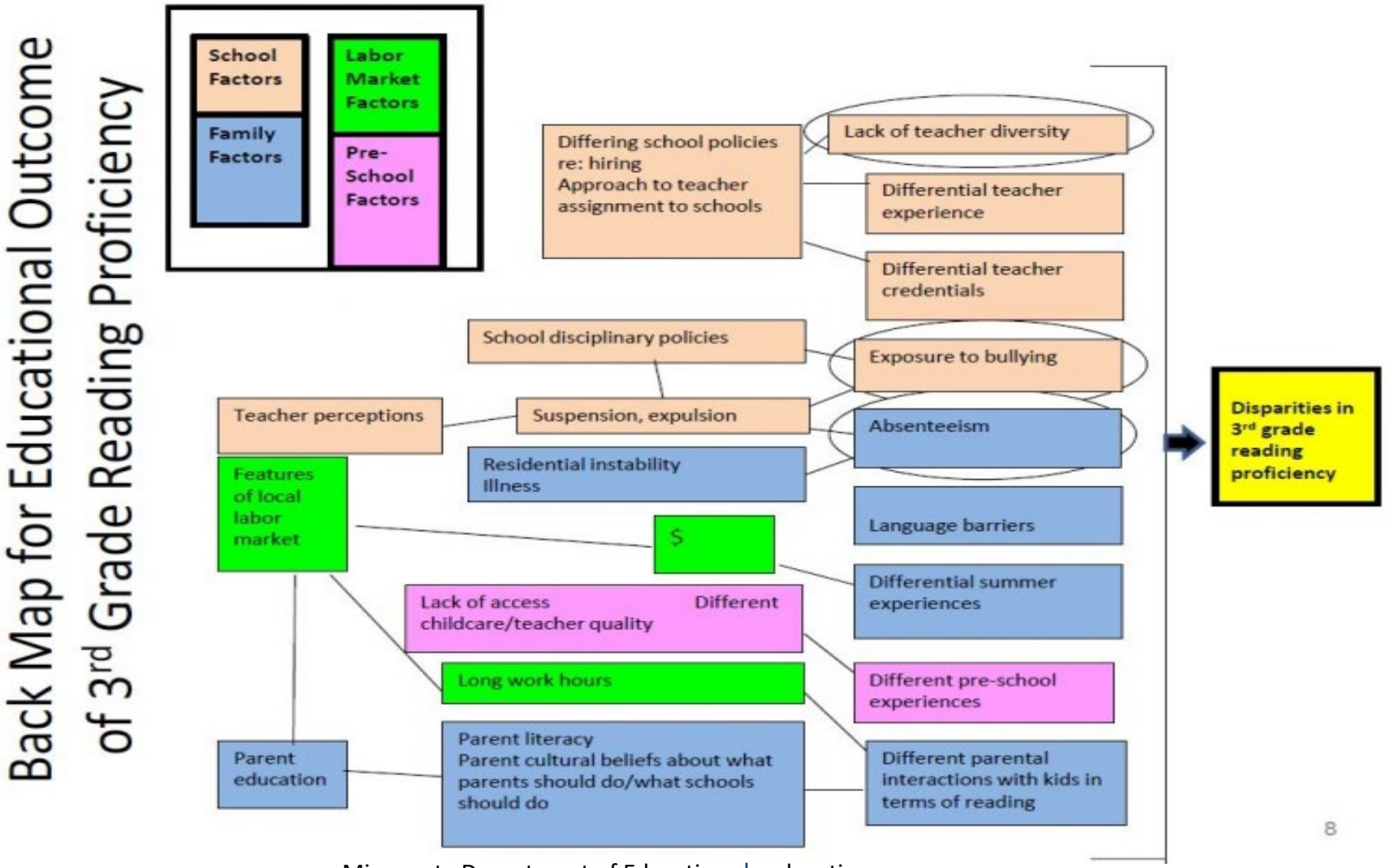
Misalignment of Instructional Supports

Frame #4: Incorporate Core P3 Concepts into Everyday Practice

Practice Alignment and Coherence

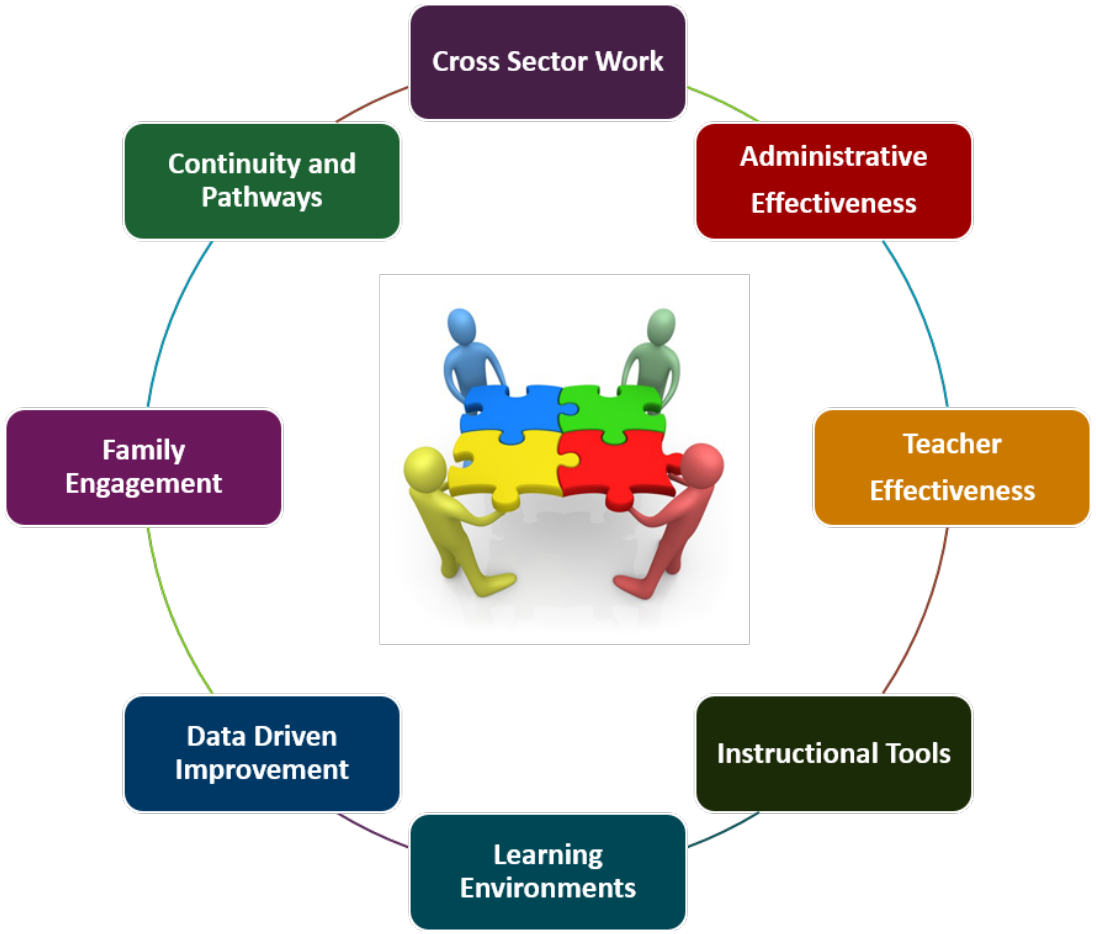
1. Incorporate alignment into your everyday thinking/practice.
   - Current: calendars, staff and student schedules, transportation, laws and policies, etc.
   - Different: transitions, discipline and relationship-based practices, curriculum and assessment, school readiness expectations, beliefs and priorities of teachers, etc.
2. Continually practice alignment and assess coherence.
   - Incoherent: early childhood program does not have access to gross motor space due to calendar/schedule. Early childhood teachers are not included in Teaching & Learning work.
   - Coherent: all staff successfully responded to emergency drill.
3. Use mapping (and other strategies) as a tool to help see potential alignment areas.

Backmapping as a Strategy

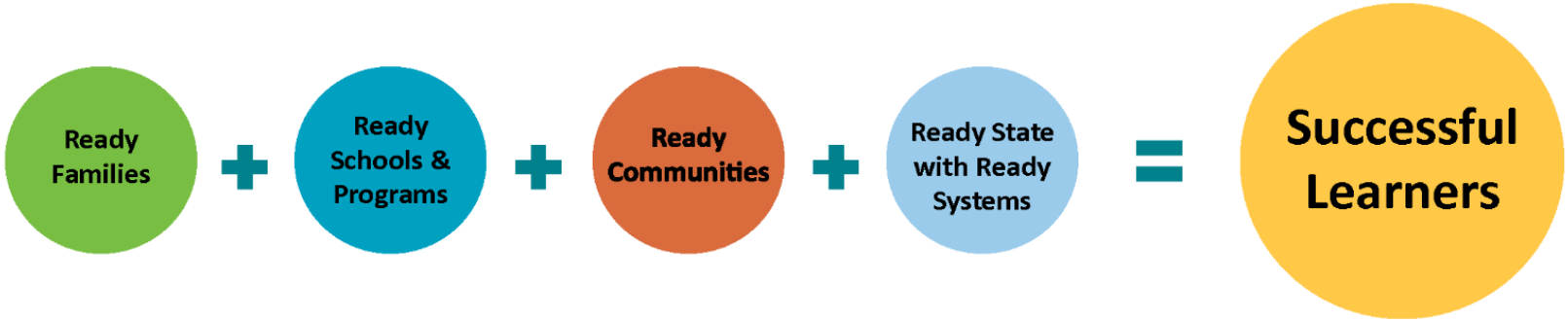


Organizational/Structural and Process Alignment

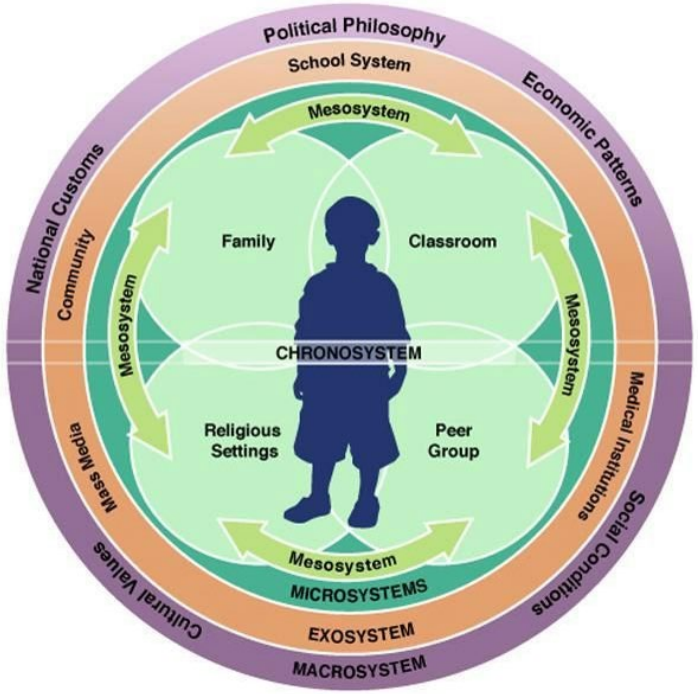
1. **P3 structural supports work outside of classrooms to build a mixed delivery system framed by quality, equity, and sustainability.**
    a. Collaborative leadership structure.
    b. Cross sector relationships between programs and community organizations.
    c. Coordinate resources that provide continuity and pathways between programs for families with easy access to programs services.
2. **Reflect on processes within classroom settings that assure quality and equity in children's experiences.**
    a. Teacher effectiveness through shared professional learning experiences that improve instructional practice and learning environments.
    b. Family engagement work is linked to learning and development.



The Role of Context: Deepening Understanding

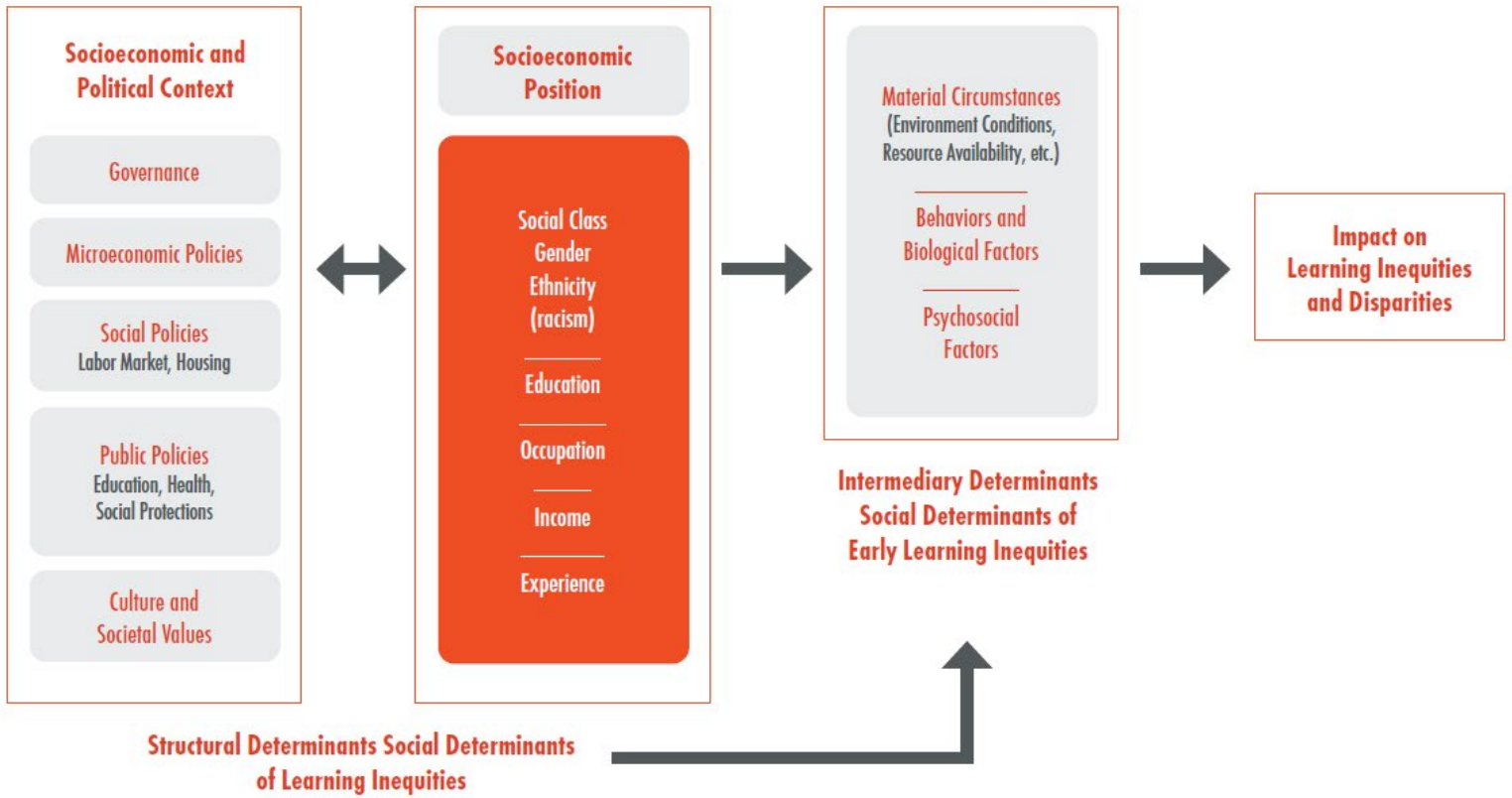


Bronfenbrenner's Ecological Model of Child Development

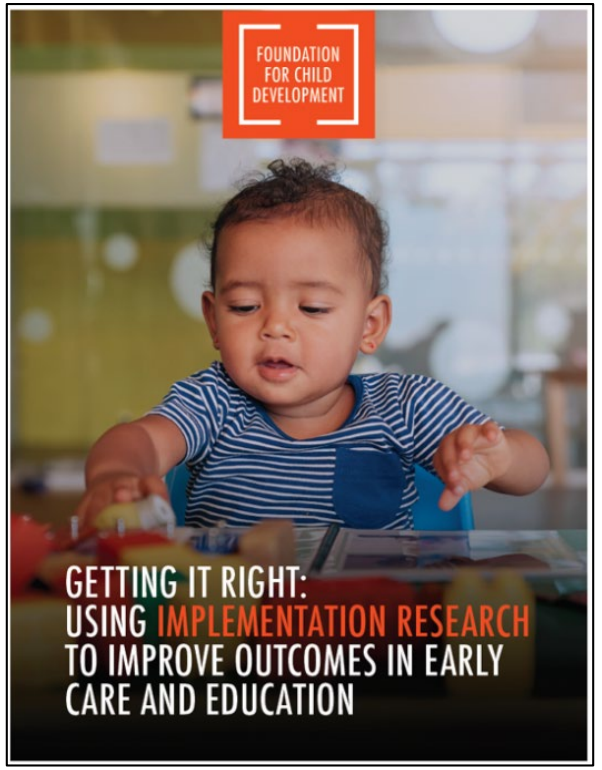


Understanding Ecosystems – General and Specific

Figure 2. Social Determinants of Early Learning.



Source: Centers for Disease Control and Prevention



Getting it Right

Frame 5: The Importance of Relationships

Collaboration

The Relational Work of Systems Change

Collective impact efforts must prioritize working together in more relational ways to find systemic solutions to social problems.

CITE SHARE COMMENT PRINT ORDER REPRINTS

By Katherine Milligan, Juanita Zerda & John Kania | Jan. 18, 2022

(Illustration by Hugo Herrera)

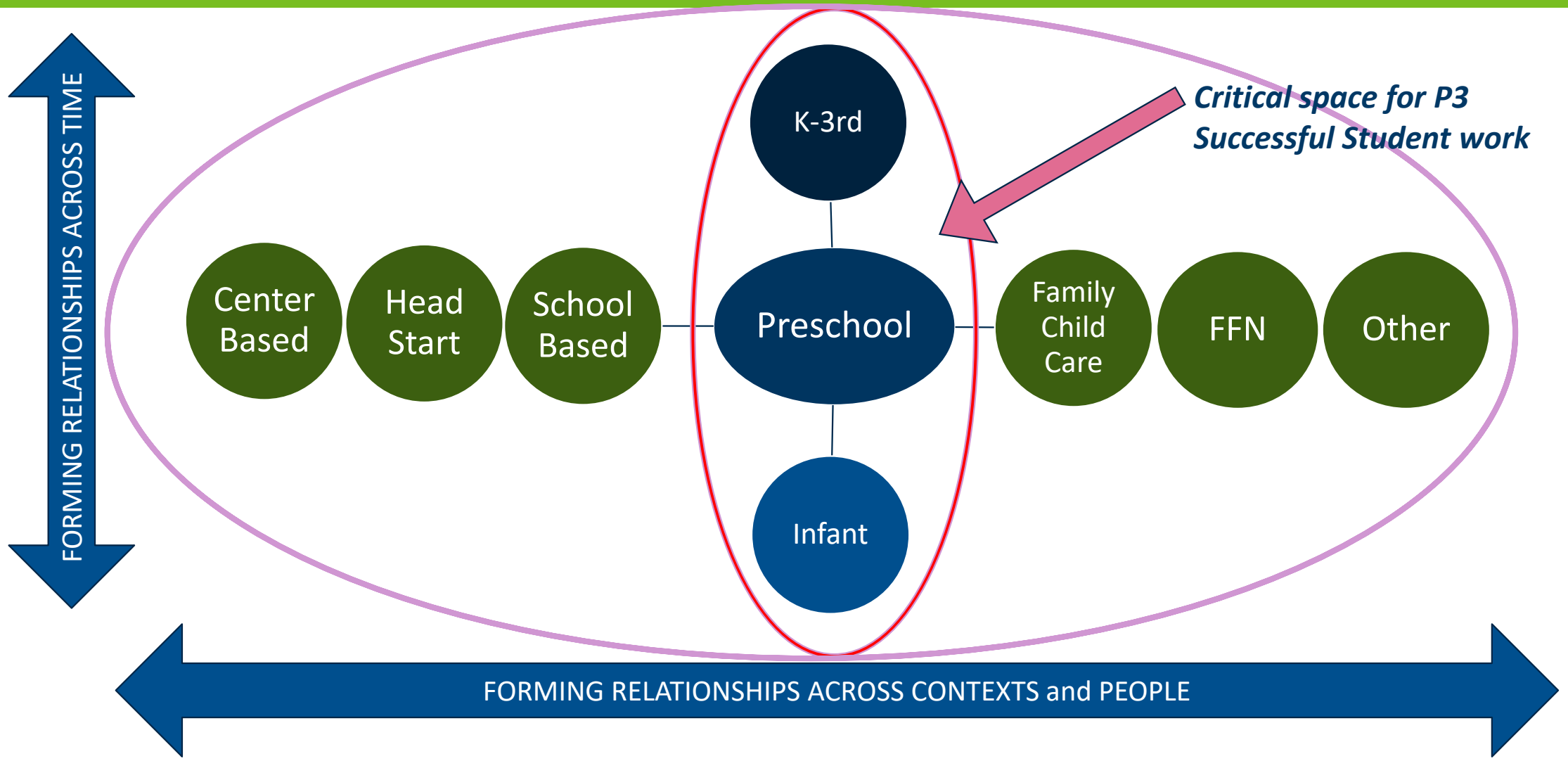
Sometimes we lose sight of a simple truth about systems: They are made up of people.

If most collective impact efforts fall short of supporting people to change in fundamentally consciousness-altering ways, then, the system they are a part of will not significantly change either.

But if the interrelated, devastating, and deepening crises and divisions over the past two years have taught us anything, it is that complex, adaptive problems defy tidy logic models and reductive technical solutions. It is time to invest our collective energy in more relational and emergent approaches to transforming systems.

Relational Work of Systems Change

Identifying Critical Early Learning Partners and Relationships



Your Learning Community – "Doing P3 *with*"

What/who are the assets in our community?

Ideally, community-driven design is used to create, implement, and evaluate your P3 system.

- P3 crosses sectors and systems – it is collaborative work.
- Who plays a role in ensuring structures can be put in place that will support P3 work/system building?

As you begin this journey, who are potential learning/work partners within your organization?

- Principal, community education director
- Early childhood administrators (district, child care, Head Start)
- District leaders, administrators

Who are potential learning/work partners within your community?

- Parents, families
- Early childhood education and care leaders
- Civic leaders, business, philanthropic, social services, etc.

Community-Based Design
World Government Summit

Frame #6: Continuous Learning and Improvement

- Commit to being a learning organization committed to P3 work.
- Learn from and with the people in your organization and community.
- Learn from others who have embarked on the same journey.
- Understand your strengths and weaknesses, in addition to leverage points in your system.
- Just like our work in K-12, work toward high-quality and what is best for children.

Focus on Quality Throughout the System

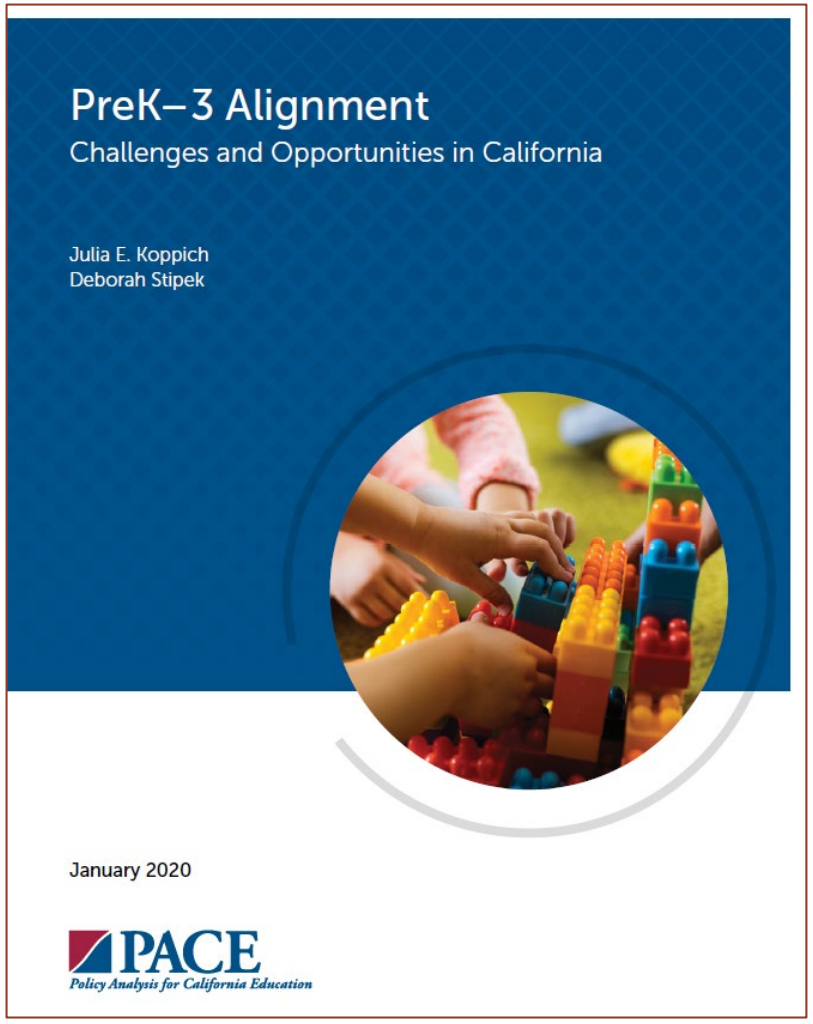
- Start by building strong leadership teams to support and guide the P3 work.
- Promote continuous improvement processes that uses many types of data to advance quality and continuity.
- Provide educators with targeted professional learning experiences informed by classroom teacher-child observation practices.
- Provide intentional instruction guided by learning progressions for all domains of learning.
- Include family voice to create programs that are culturally and instructionally responsive.
- Advocate and allocate predictable sustainable funding.

Crosswalk of P3 and Essential Elements of Quality*

Building Leadership Capacities		Building Competencies			Systems Organization		
Cross Sector Work	**Administrative Effectiveness**	**Teacher Effectiveness**	**Instructional Tools**	**Learning Environments**	**Data-Driven Improvement**	**Engaged Families**	**Continuity and Pathways**
• Build strong leadership teams • Form integrated systems	• Gain public commitment • Establish a compelling vision and well-versed leaders	• BA and equitably compensated • Cap class size at 20 • Two adults/ classroom 1:10 ratio • Professional Development informed by teacher-child observation	• Minimum 350 of Instructional Hours • Early Learning Standards (ECIPS) • Effective curriculum • Use of KEP assessments to inform instruction	• Inclusive settings • Appropriate indoor and outdoor learning spaces • Strong supports for multi-language learners	• Data Driven improvement and independent evaluation	• Programs and teachers engage families forming reciprocal relationships • Programs engage families in decision-making	• Integrated systems • Mechanisms for aligned and coordinated transitions

* Elements for quality identified through research from National Institute for Early Education Research (NIEER) and Bill and Melinda Gates Foundation.

Learn from Others Who are Working on P3

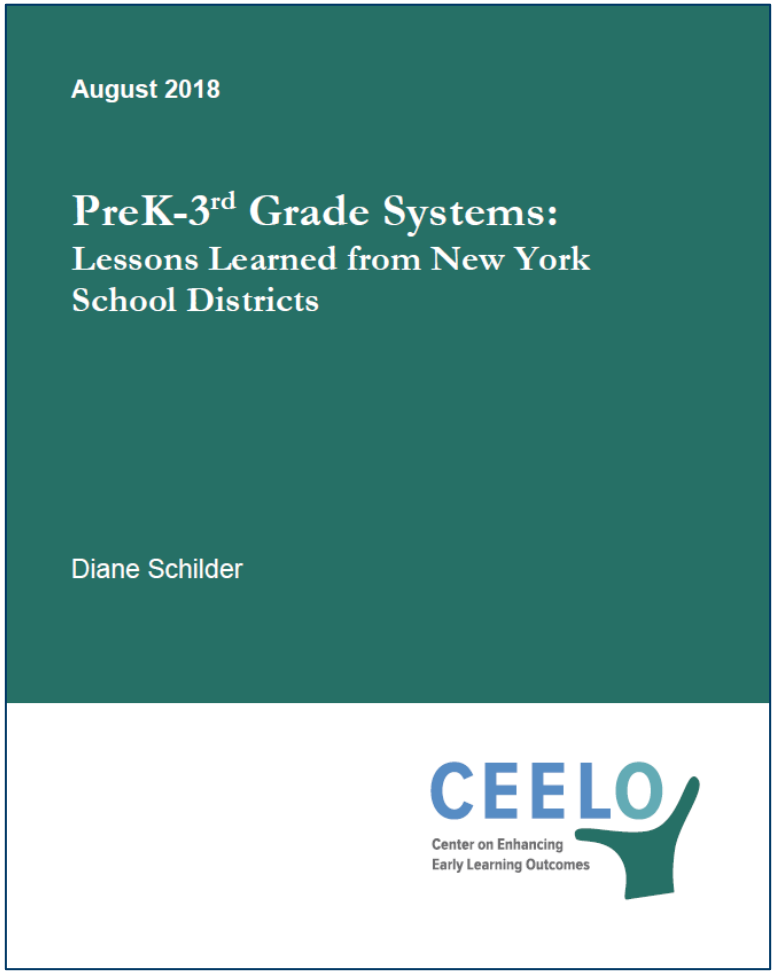


- Interview results revealed that preK–3 teachers' access to and use of student data generally was limited.
- PreK–3 teachers neither have access to nor discuss collectively relevant information about their students, many of whom will be shared as students advance in grades. A cooperatively developed understanding of student progress and challenges could contribute to a greater appreciation of the need for preK–3 alignment as well as aid the alignment process.

p. 13-14, PreK-3 Alignment – California

Lessons Learned from New York School Districts

- Select team members carefully.
- Build on existing strengths, priorities and efforts.
- Recognize where the district is on the path of PreK-3rd grade planning and implementation.
- Focus on early success in a few areas and then build on that success.
- Engage champions in the effort.
- Phase in activities and learn from early implementation.
- Develop a communication strategy.



Bias Toward Action

What is the problem we are addressing?

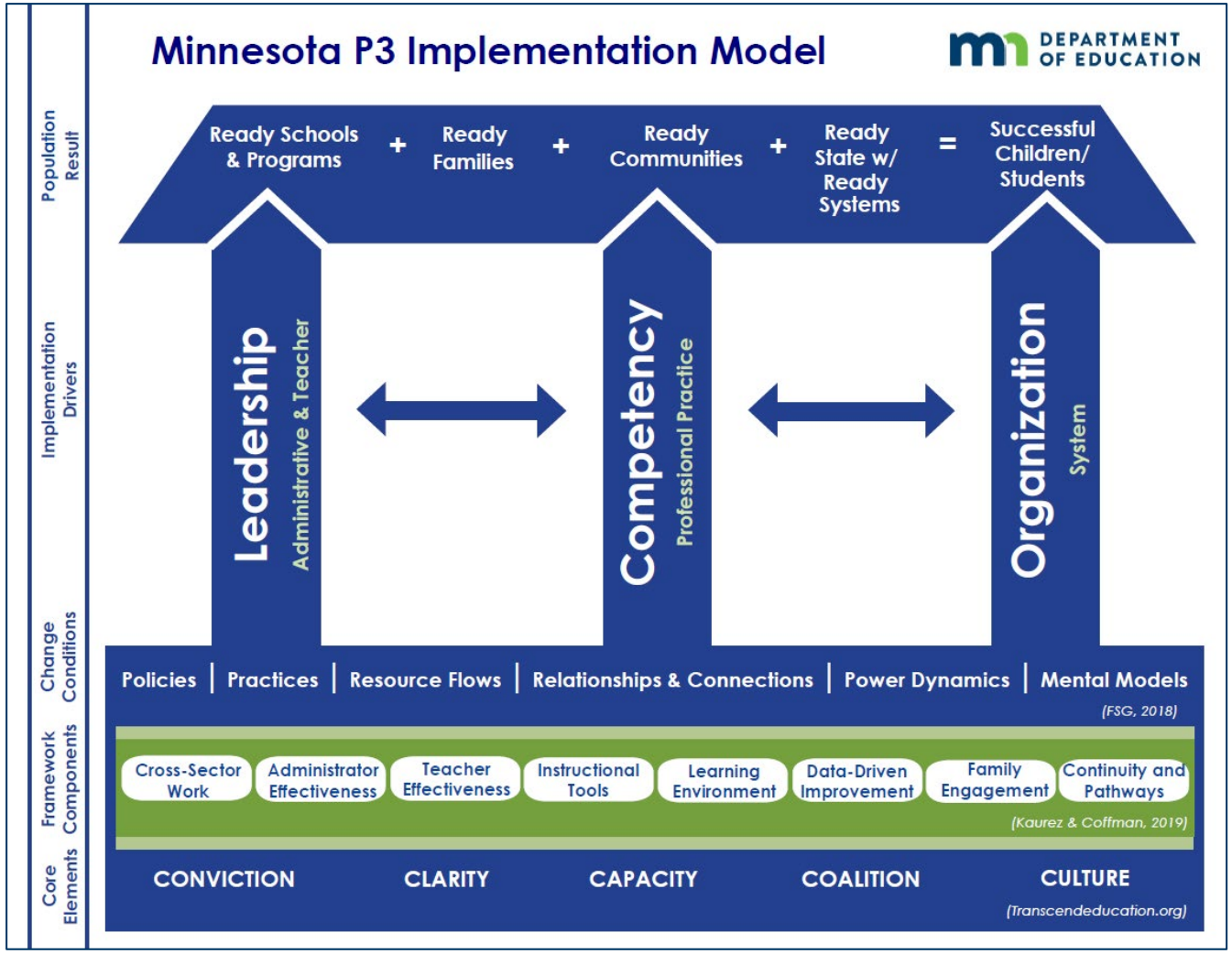
Some P3 work requires preparation before action, but the fun part about P3 work is that we can act on it at any time.

- Alignment and coherence are already a daily part of our lives (it would be chaos without them).
- In what ways does a classroom teacher practice alignment?
- Where might alignment problems cause inefficiencies and challenges in a system?

Bias Toward Action. Bias Toward Action is a focus on action-oriented behavior rather than discussion-based work. A "bias toward action" mindset utilizes all modalities of learning.

- from *Design Thinking: An Educational Model towards Creative Confidence*

Frame #7: Ensure Structures are in Place to Support P3



Learning Organization and P3

- Personal mastery: **all** are learning about and practicing P3 (systems work).
- Mental Models: continually examining the way things are done. Looking for and practicing new ways.
  - Ex) Redefining the notion of Readiness as being a responsibility of adults, programs and systems.
- Team learning: Collaborating to build capacities, create loops.
  - Moving from privatized classrooms to teams.
  - Creating cross-sector leadership teams.
- Shared vision: Everyone understands the purpose of the work, their role, etc.

Peter Senge's Learning Organization

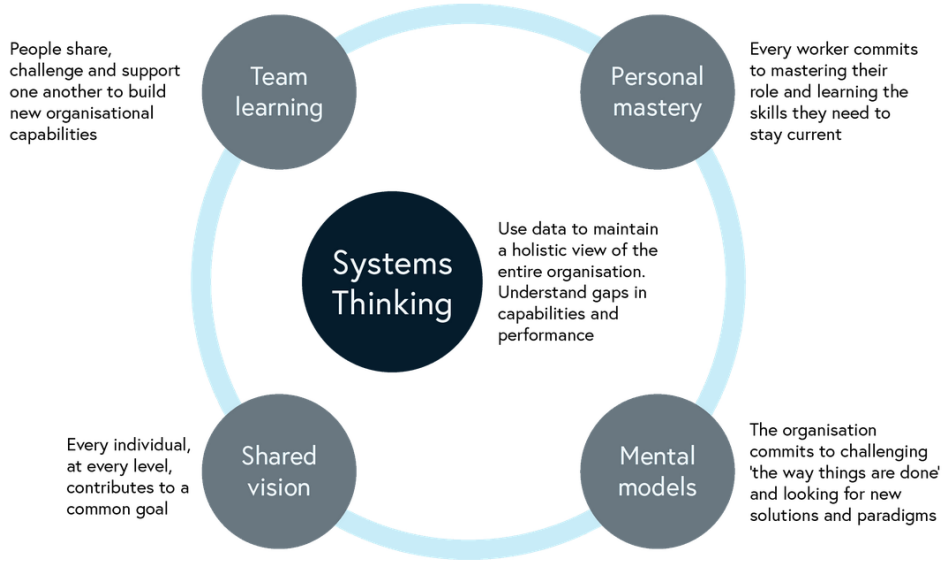


Image from Logicearth Learning Services

School as a Learning Organization

DOI: 10.1111/ejed.12383

ORIGINAL ARTICLE

WILEY

The school as a learning organisation: The concept and its measurement

Marco Kools[1] | Louise Stoll[2] | Bert George[3] | Bram Steijn[4] | Victor Bekkers[4] | Pierre Gouëdard[1]

[1]OECD, Paris, France
[2]UCL Institute of Education, London, UK
[3]Department of Public Governance and Management, Ghent University, Ghent, Belgium
[4]Erasmus University Rotterdam, Rotterdam, The Netherlands

Correspondence
Marco Kools, OECD, 2 rue André-Pascal, 75016 Paris, France.
Email: mkools@oecd.org

Abstract

A growing body of scholars, educators and policy makers has argued for reconceptualising schools as "learning organisations" in the last 25 years as. However, a lack of clarity on the concept has hindered its advance in theory and practice. This study responds to this problem by developing a schools as learning organisations scale that expands and clarifies the concept on several points. Drawing on survey data (nschool staff = 1,703) from Wales (UK), it examines the key characteristics of a school as a learning organisation through a principal component analysis and reliability analysis. The results showed that such a school is associated with eight dimensions: (a) a shared vision centred on the learning of all students, (b) partners contributing to school vision, (c) continuous learning opportunities, (d) team learning and collaboration, (e) a culture of enquiry, innovation and exploration, (f) systems for collecting and exchanging knowledge and learning, (g) learning with and from the external environment, and (h) modelling learning leadership. The resulting 65-item scale demonstrated good psychometric qualities. A reliable and valid schools as learning organisations scale can help enhance our understanding of the concept. The scale can also be used by school leaders, teachers and all others wanting to develop a thriving learning culture in their schools.

 © 2020 John Wiley & Sons Ltd

[School as a Learning Organization]

FIGURE 1 School as a learning organisation model. *Source:* Kools and Stoll (What Makes a School a Learning Organisation?, 2016), "What Makes a School a Learning Organisation?", *OECD Education Working Papers*, No. 137, OECD Publishing, Paris

Great Teamwork

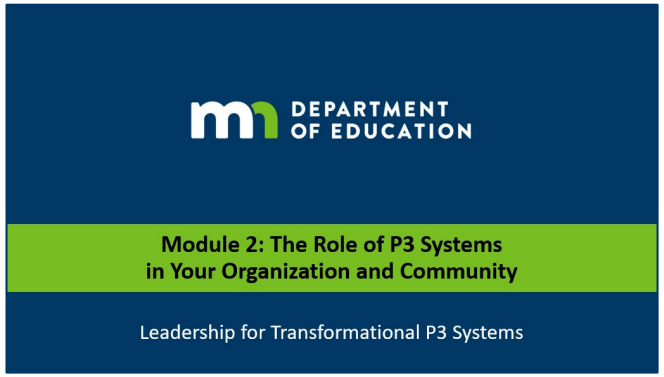
What do we want to achieve together?

The Enabling Conditions
How to create a climate that helps diverse, dispersed, digital, dynamic teams (what they call 4-D teams) attain high performance.

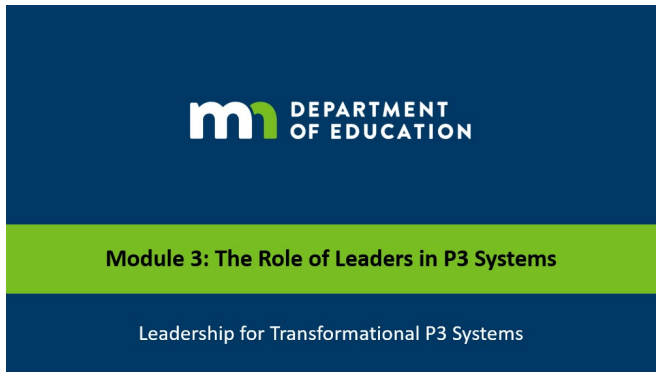
1. **Compelling direction**
   The foundation of every great team is a direction that energizes, orients, and engages its members.
2. **Strong structure**
   Teams also need the right mix and number of members, optimally designed tasks and processes, and norms that discourage destructive behavior and promote positive dynamics.
3. **Supportive context**
   Having the right support is the third condition that enables team effectiveness.
4. **Shared mindset**
   Developing a shared mindset among team members—something team leaders can do by fostering a common identity and common understanding.

Harvard Business Review

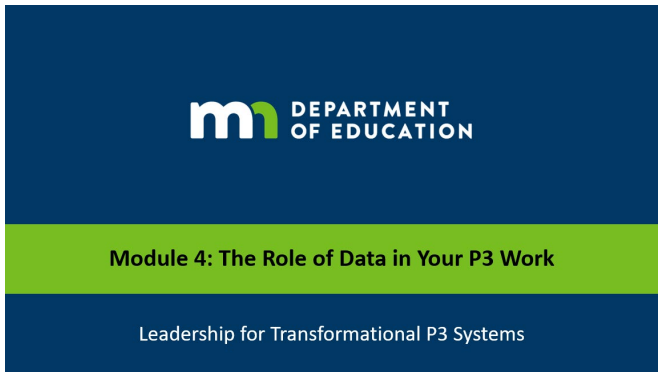
Course Overview: 7 Modules



2: Role of P3 Systems

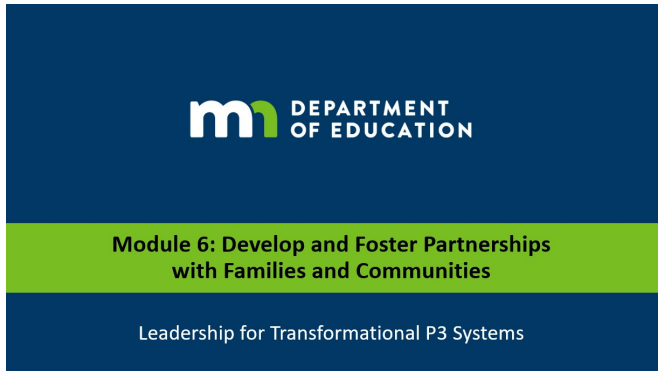


3: Role of P3 Leaders

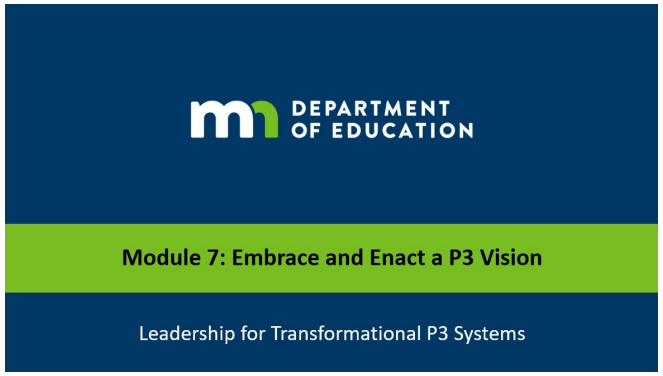


4: Role of Data in P3 Work

5: Child Development and P3



6: P3 Partnerships



7: Enact Your P3 Vision

Resources to Help Understand P3 Work

- The National P3 Center's: *Framework for Planning, Implementing and Evaluating P-3 Approaches*
- *NAESP: Leading Prek-K-3 Learning and the Early Grades.*
- *MDE Early Learning* webpage for information and resource links to information about: P3, elements of quality, Early Childhood Indicators of Progress, KEP assessments, transitions, kindergarten enrollment practices, and more.
- Administration of Early Childhood Programs Resource pages for a collection of resources and learning modules related to early childhood programs.
- *Brookings Institute: Leapfrogging Inequality: Rethinking Education to Help Young People Thrive.*
- *Foundation for Child Development: Getting it Right: Using Implementation Research to Improve Outcomes in Early Education and Care.* View the FDC report here.
- The Ounce of Prevention Fund
- The Learning Policy Institute: Untangling the Evidence

Thank you!

Mike Brown

mike.p.brown@state.mn.us

June Reineke

june.reineke@state.mn.us