

Northwestern

# Educational Policy & Teaching Practice:

## Engaging the Challenge of Educational System Building

James P. Spillane

Northwestern University | The Education University of Hong Kong

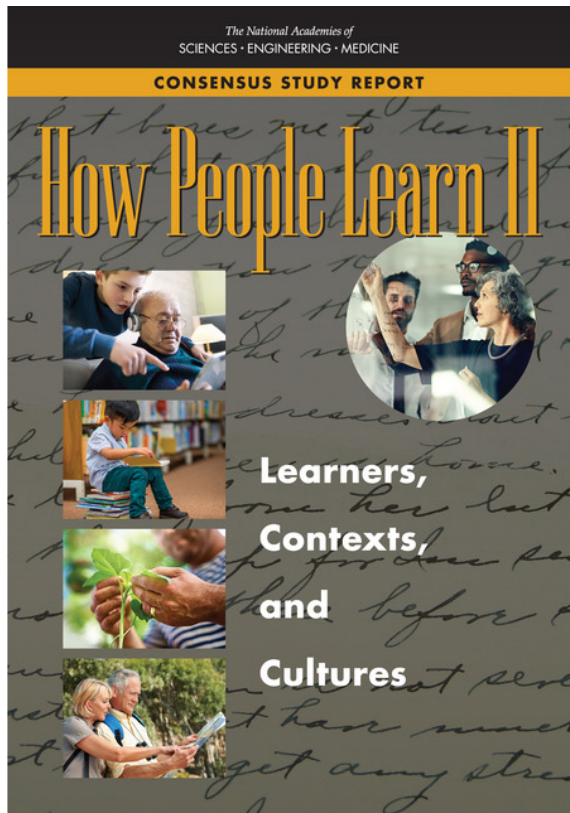


@jamespspillane

*The Distributed Leadership Studies*  
[www.distributedleadership.org](http://www.distributedleadership.org)

*Funded by National Science Foundation,  
Spencer Foundation, Institute for  
Education Sciences, & Carnegie  
Corporation*

# Instructional Policy: New Ambitions



## Intellectually Rigorous Instruction

- Deep learning
- 'Authentic' disciplinary experiences
- Culturally responsive instruction

## Enacting Policy Ideals in Practice

- Academic Tasks
- Classroom Discourse

# Policy and Teaching Practice



**Policy  
Discourses**



**Policy  
Texts**



**Policy  
Technologies**

# A Familiar Challenge: Change At Scale



**Implementation**



**Institutionalization**

# Dimensions of Scale



**Spread**



**Stake**



**Spirit**



**Stick**

# Why Policy Fails?



**Design of Policy  
Texts & Technologies**



**Motivation and  
Capability**

# Preview

## 01

### Building Educational Systems

- One school system's efforts to design and deploy an educational infrastructure for mathematics
- Educational Infrastructure in everyday practice in schools and school systems.
- Evidence of effects on practice.

# Preview

## 01

### Building Educational Systems

- One school system's efforts to design and deploy an educational infrastructure
- Educational Infrastructure in everyday practice.
- Evidence of effects on practice.

## 02

Key lessons about building educational systems to support implementation, institutionalization, and instructional innovation

# Preview

## 01

### Building Educational Systems

- One school system's efforts to design and deploy an educational infrastructure for mathematics
- Educational Infrastructure in everyday practice in schools and school systems.
- Evidence of effects on practice.

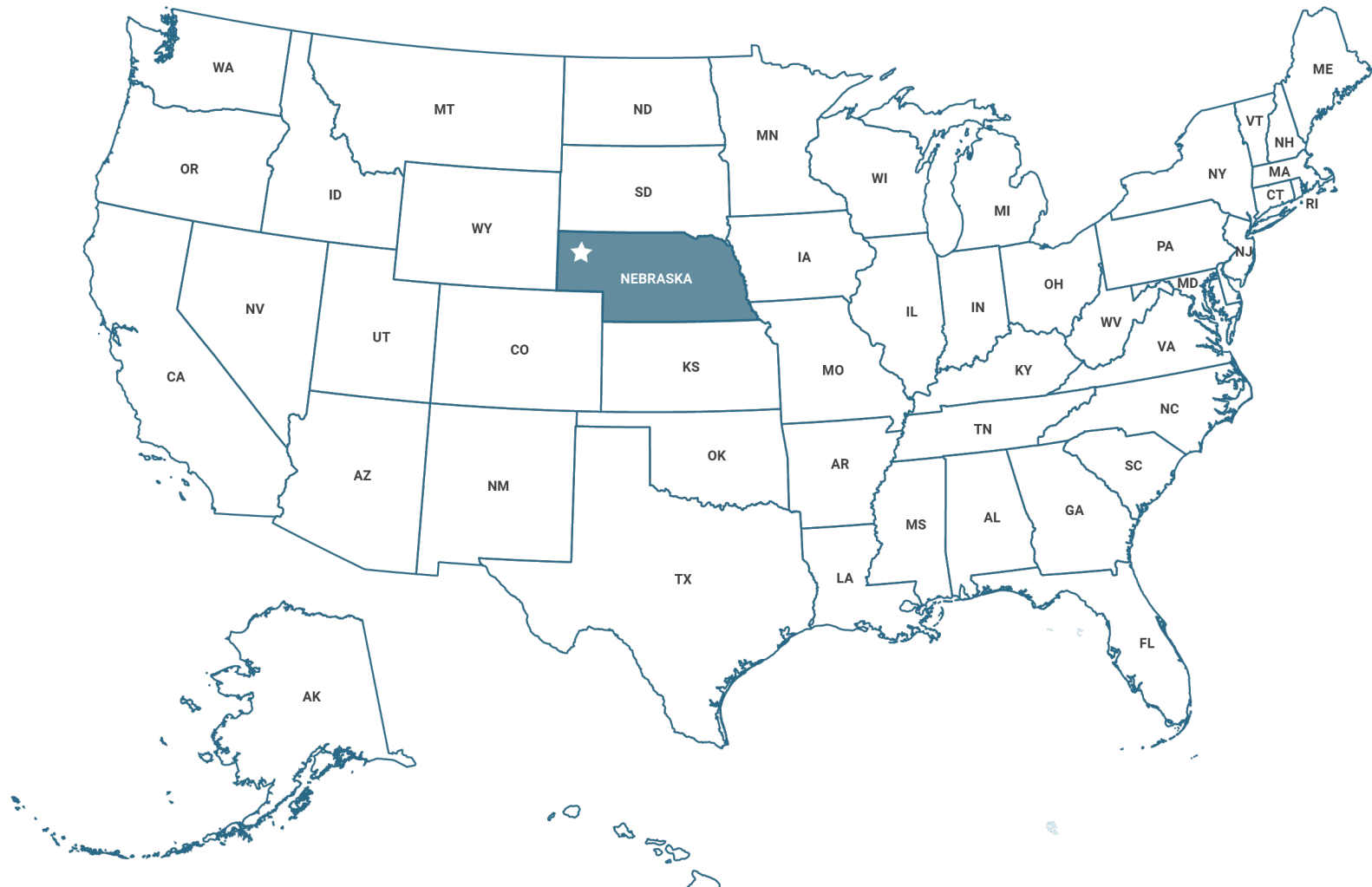
## 02

Key lessons about building educational systems to support implementation, institutionalization, and instructional innovation

## 03

The opportunities and challenges of educational system building in the time of COVID

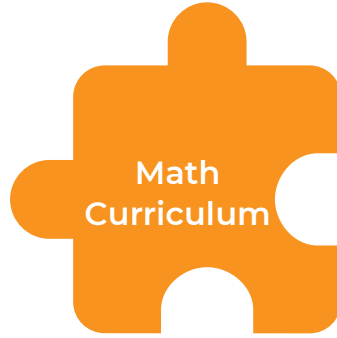
# A Case Study of Educational System Building



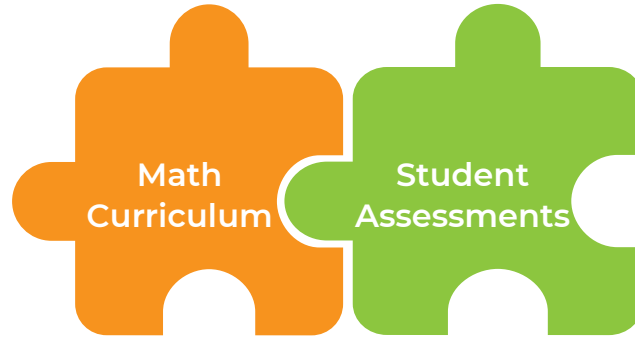
# Research Approach

- Case Study
- Sequential explanatory mixed-methods design
- Annual surveys of school & school system staff
- Theoretical/Purposeful sample of schools and school actors

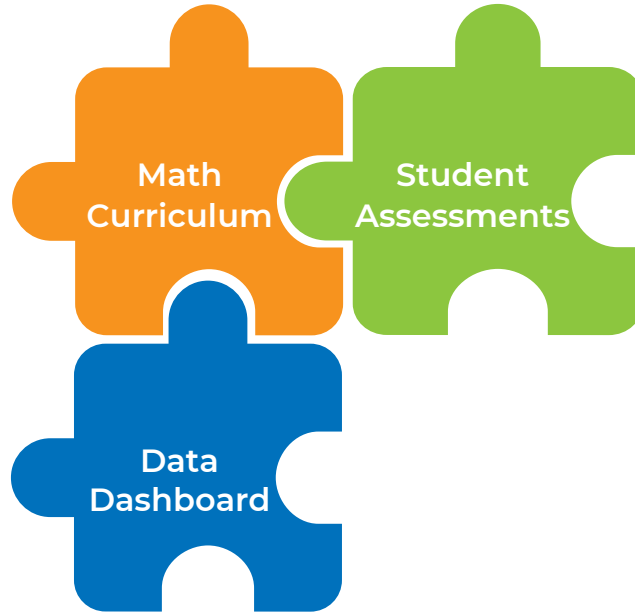
# Auburn Park: A Case of Educational Infrastructure Redesign



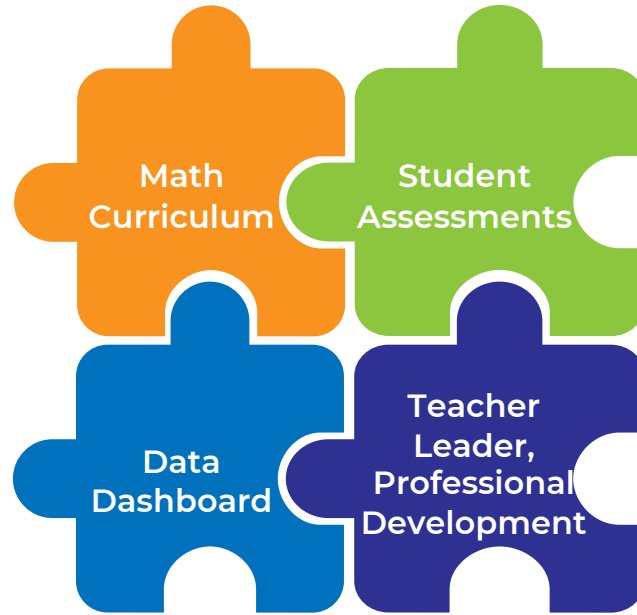
# Auburn Park: A Case of Educational Infrastructure Redesign



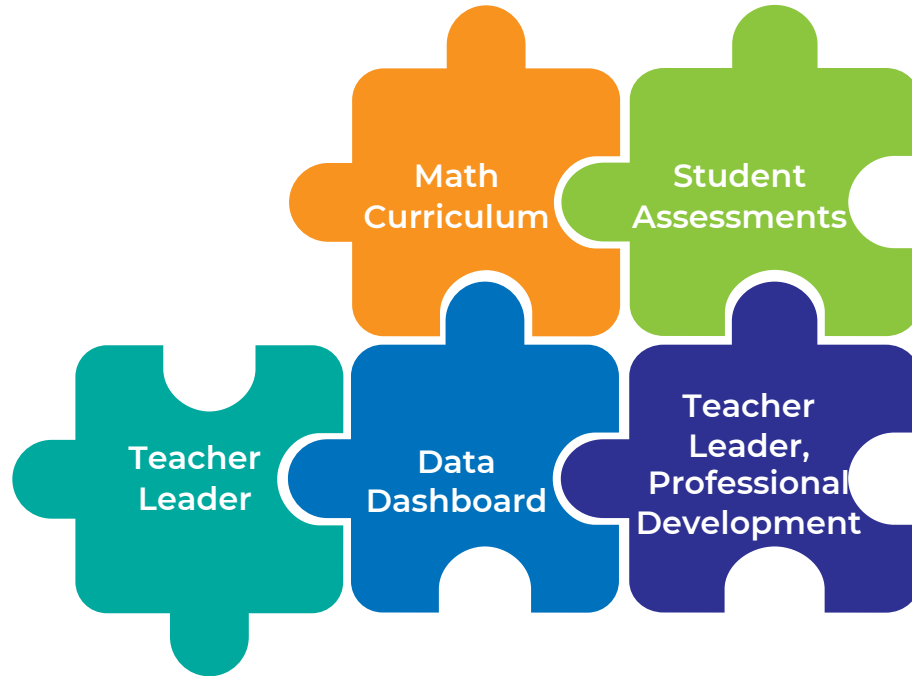
# Auburn Park: A Case of Educational Infrastructure Redesign



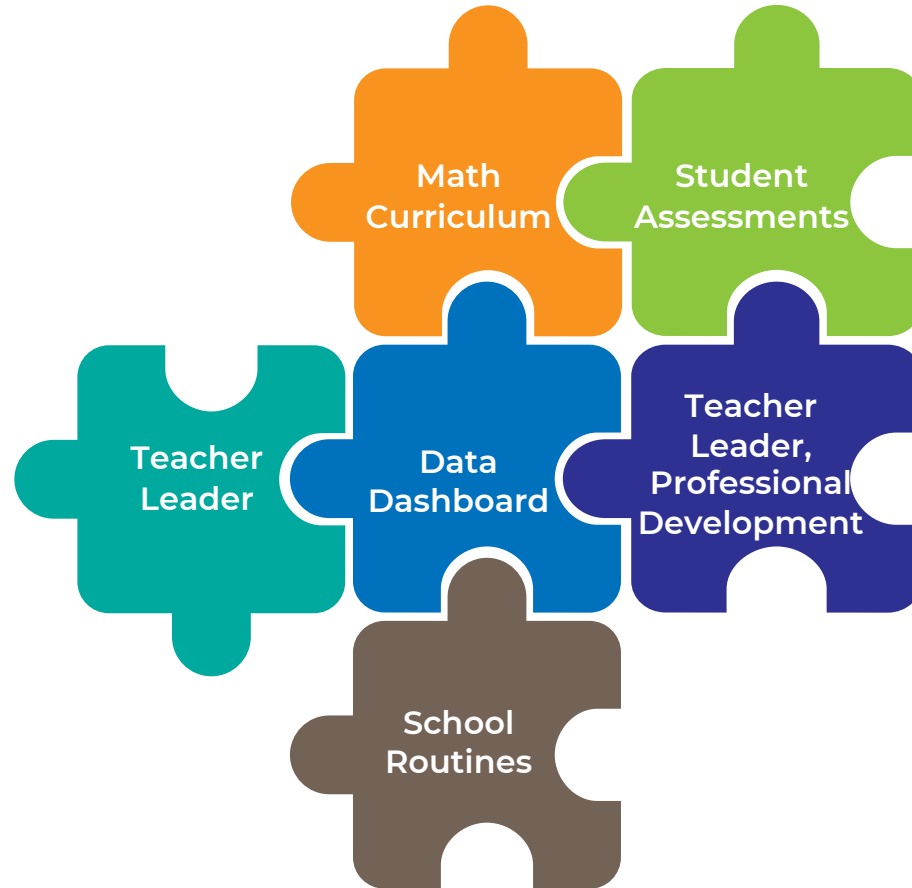
# Auburn Park: A Case of Educational Infrastructure Redesign



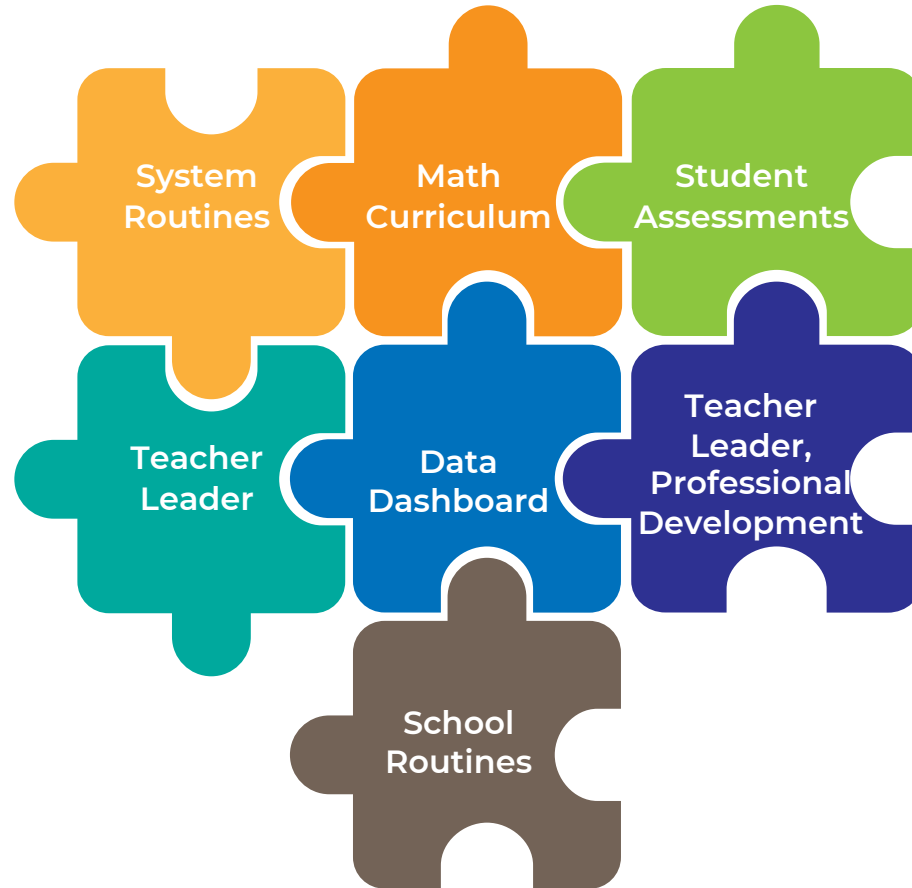
# Auburn Park: A Case of Educational Infrastructure Redesign



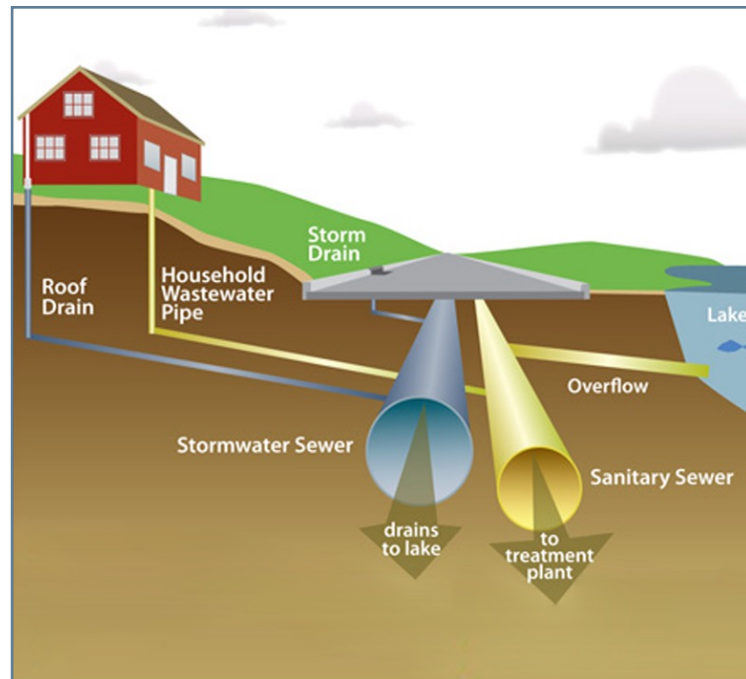
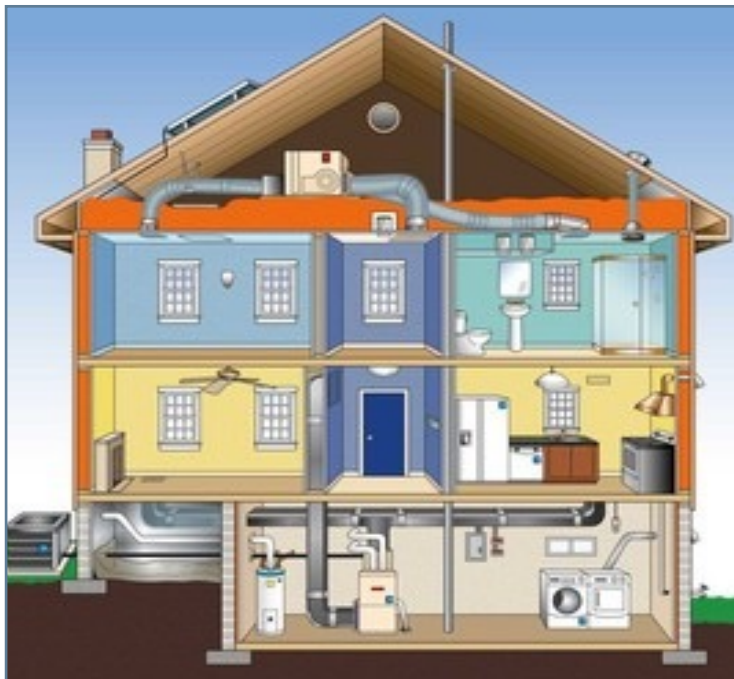
# Auburn Park: A Case of Educational Infrastructure Redesign



# Auburn Park: A Case of Educational Infrastructure Redesign



# Infrastructure



# Educational Infrastructure

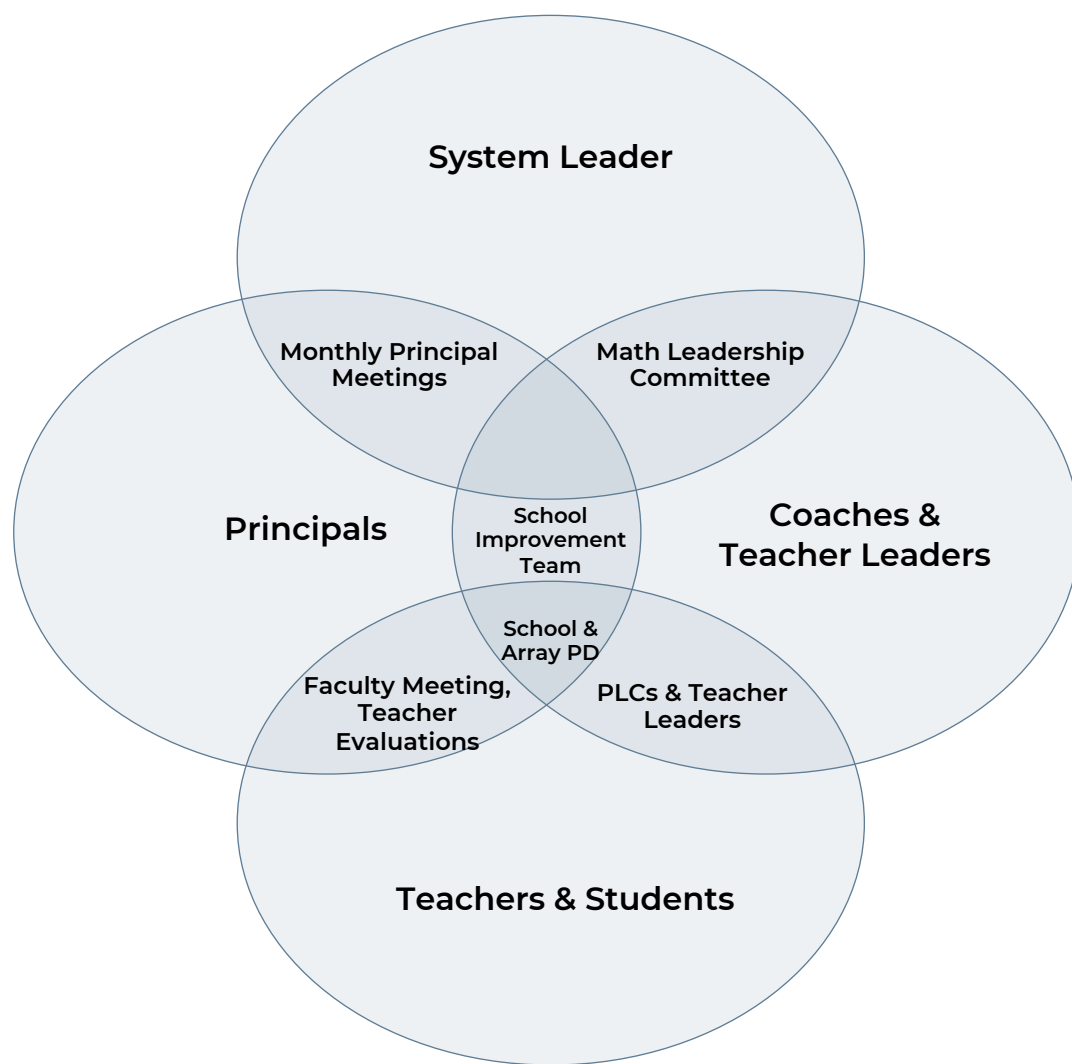
- Educational Infrastructure refers to structures and resources that educational systems and schools mobilize to enable (and constrain) teaching, maintain teaching quality, and lead improvement in teaching.

# Educational Infrastructure

- Educational Infrastructure refers to structures and resources that educational systems and schools mobilize to enable (and constrain) teaching, maintain teaching quality, and lead improvement in teaching.
- Educational Infrastructure includes:
  - the instruments and tools that are the materials of instruction (e.g., curriculum and summative and formative student assessments).
  - the formal positions, routines, procedures, and rules for guiding professional learning, maintaining quality, and enabling improvement.
  - professional norms, values, and cognitive scripts that infuse the work.

# Educational Infrastructure





# Educational Infrastructure & Social Interactions

- Educational infrastructure foster interactions about instruction by
  - Creating and maintaining boundary practices among different 'Communities of Practice' systemwide
  - Providing boundary objects to anchor and focus negotiations among participants in boundary practices
  - Preparing and mobilizing boundary spanners to support interactions among participants in boundary practices

# Math Leadership Committee as Boundary Practice

“

We're given a lot of training in the committee **that we're expected to bring back** to the buildings, and so **we hear about a lot of things** . . . I think that **deepens the understanding** and kind of the light bulb goes on of, “These are things I need to be doing.

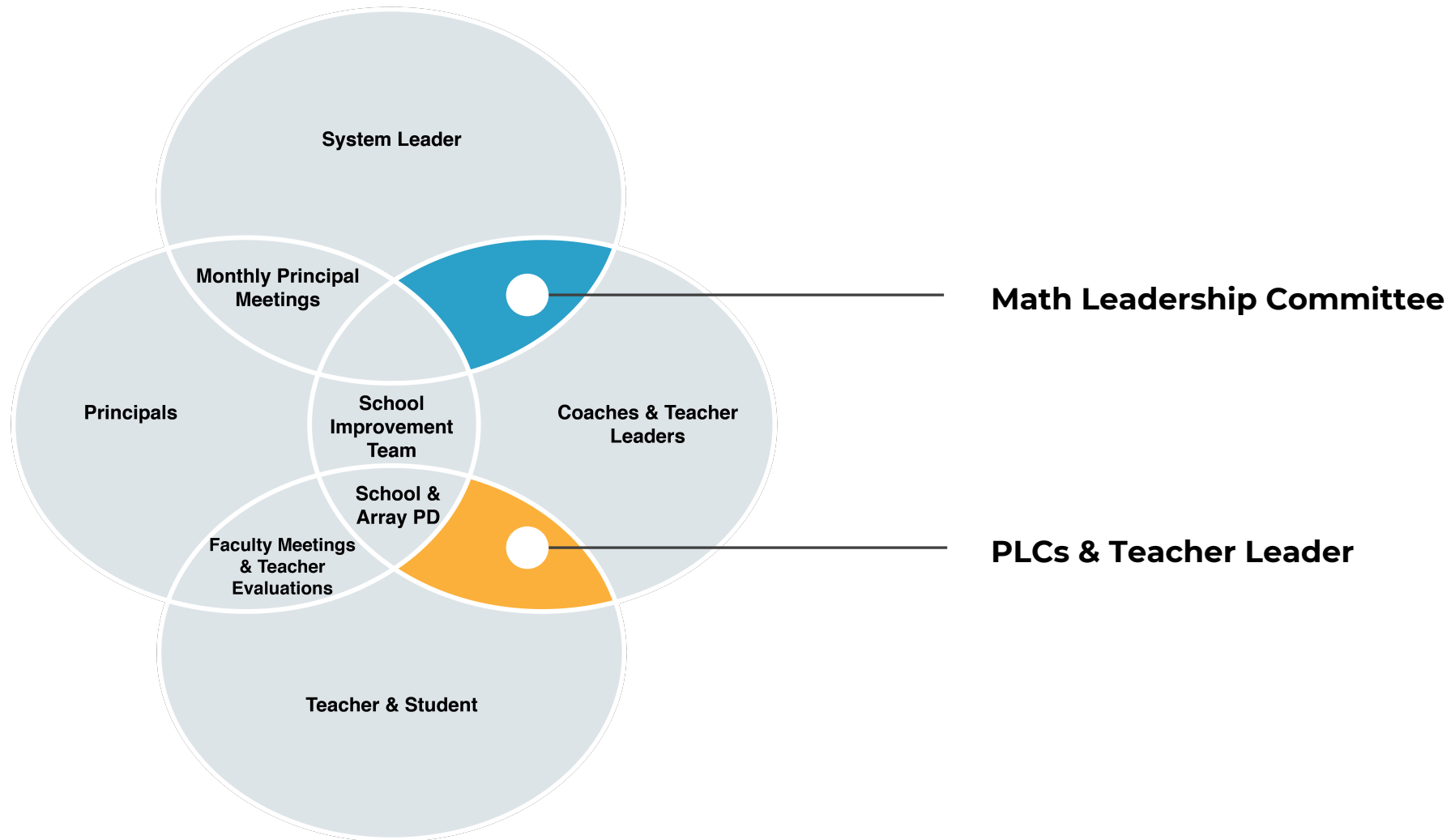
— Jodie, Special Education Teacher

# Boundary Practices and Spanners

“

We have had that benefit of having [Gabrielle] on the [district] **math leadership [routine]** and so she was looked upon as you know more of an expert. And **she would come back and share everything with us** ... we kind of felt more in the math loop.

— Clarissa, 1<sup>st</sup> grade



# Boundary Practices and Boundary Spanners

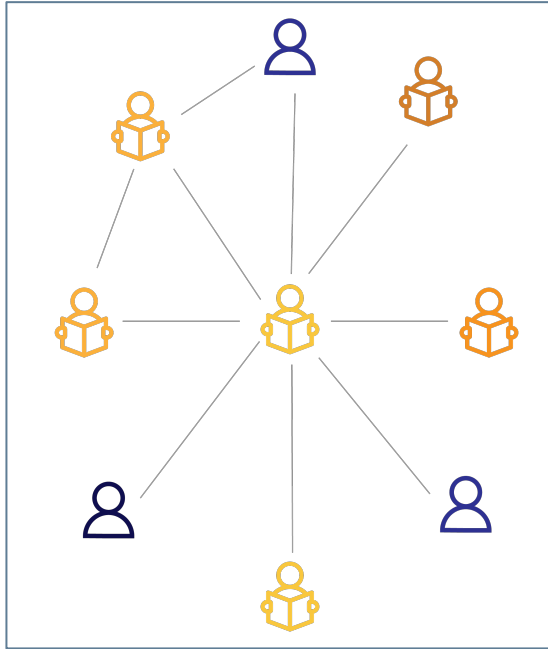
“

**Our [grade] team** plans, and we get to collaborate together ... **our math coach** ... when we're planning together if we have a question, she's always there to help ... she knows a lot ... ”

— Rachel, Kindergarten

# Math Coach as Boundary Spanner

2009 — 10



Kindergarten



2nd Grade



3rd Grade\*



5th Grade



Coach



SPED



INSTRFACIL\*\*



System Leader



DIRELEMCURR\*\*



1st Grade



3rd Grade



4th Grade



6th Grade



LITFACIL



PRIN



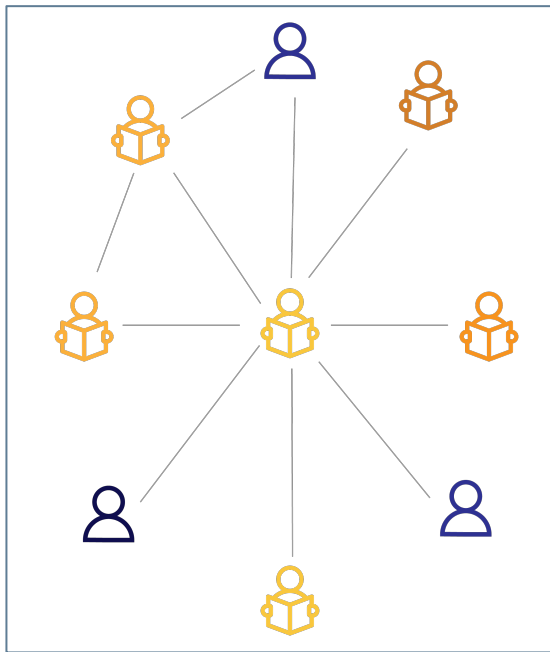
DIRESEARCH\*\*



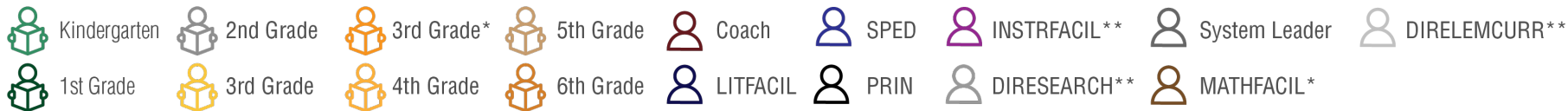
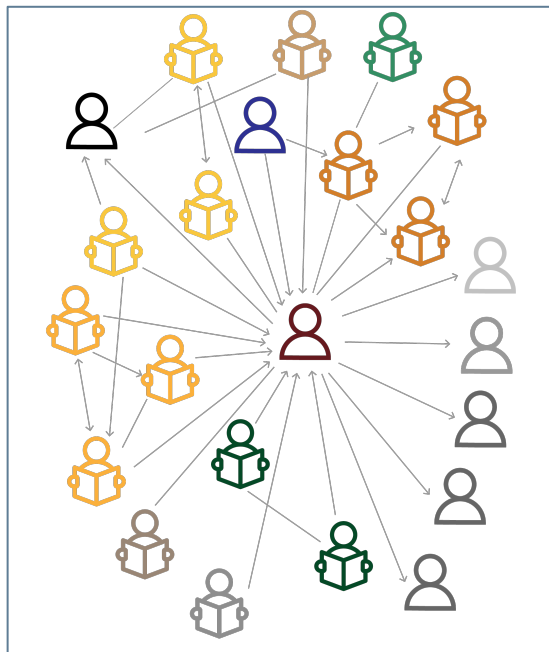
MATHFACIL\*

# Math Coach as Boundary Spanner

2009 — 10

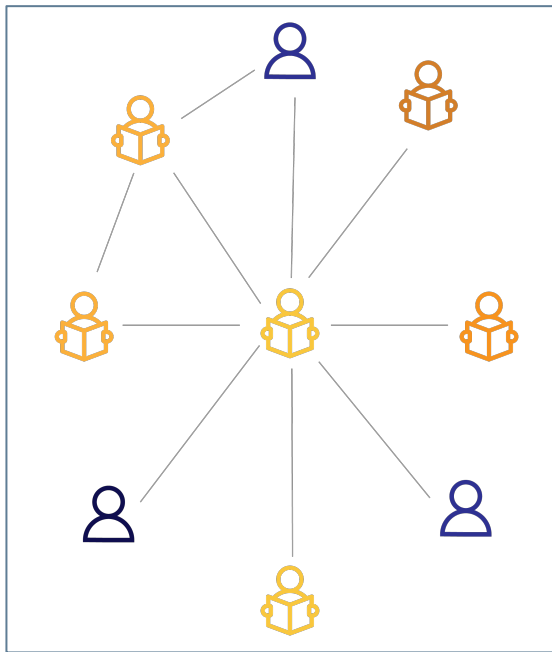


2010 — 11

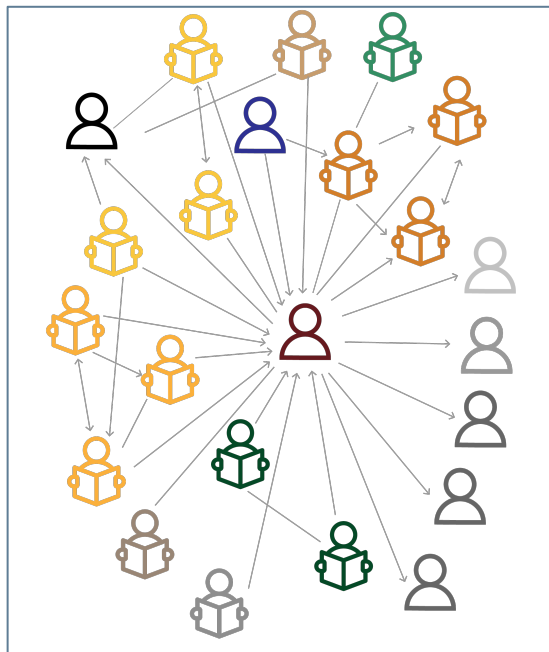


# Math Coach as Boundary Spanner

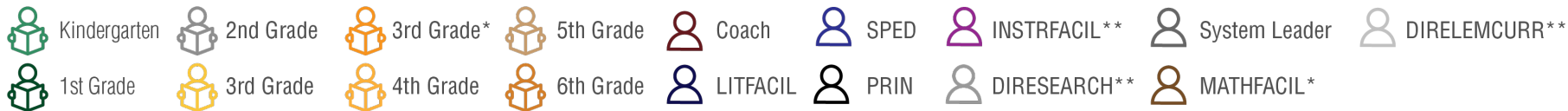
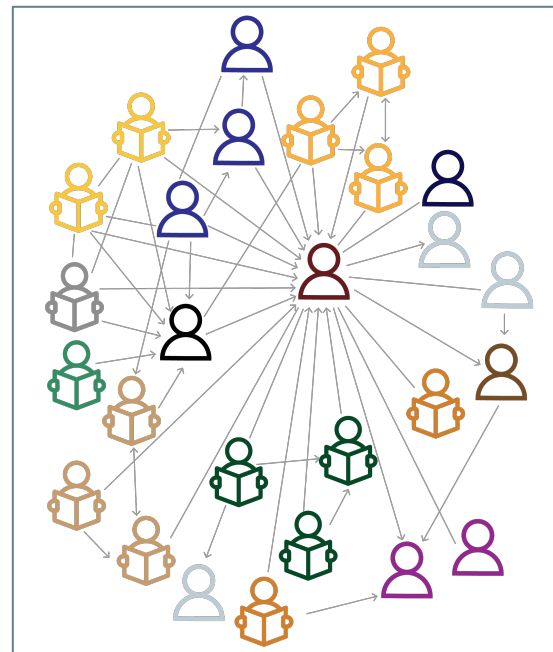
2009 — 10



2010 — 11



2011 — 12



# Curriculum as Boundary Object

“

It's just **so different** [new math curriculum ], the investigating part of it . . . just trying to make sure, 'Golly, tell me again, **what's the purpose of this** classroom activity?' . . . Some of **them don't really kind of make sense to me.**

— Andrea, 3<sup>rd</sup> Grade

# Students Assessment Responses: As Boundary Object

“

They're helping me think through, **“Is this an appropriate response for a fifth grader?”** Sometimes I think it's not, but she'll point out, “But they did this and this” and I'll have not thought about that, like, “They used this vocabulary well” ... helping me analyze student responses and just show understanding.

— Carmen, 5<sup>th</sup> Grade

# Supporting Educational Infrastructure in Use

“

**Over the years it's changed** as we first moved into the [PLC] process. **I was a lot more involved as far as setting up what they would talk about, leading the discussions.** . . . And the teams, their capacity to work as purposeful teams has really grown over time so **they develop their own agendas** . . . it's left up to them. **They have ownership.**

— Georgia, principal

# Infrastructure Redesign Promoted Advice and Information Seeking in Mathematics

|                                                     | 2019 — 2010 | 2010 — 11      | 2011 — 12 |
|-----------------------------------------------------|-------------|----------------|-----------|
| Participants in School System Routines for Math (6) | 1.60        | 2.80           | 2.67      |
| Teacher Leaders (9)                                 | 4.33        | <b>6.00*</b>   | 6.00      |
| Math Coaches (3)                                    | 6.33        | <b>16.33**</b> | 18.00     |
| Classroom Teachers (256)                            | 1.54        | 1.60           | 1.36      |

# Infrastructure Redesign Promoted Brokering in Mathematics

|                                                     | 2019 — 2010 | 2010 — 11       | 2011 — 12 |
|-----------------------------------------------------|-------------|-----------------|-----------|
| Participants in School System Routines for Math (6) | 5.00        | <b>75.80*</b>   | 48.86     |
| Teacher Leaders (9)                                 | 32.44       | <b>144.33*</b>  | 115.42    |
| Math Coaches (3)                                    | 38.67       | <b>248.67**</b> | 222.97    |
| Classroom Teachers (256)                            | 10.85       | <b>24.81*</b>   | 11.90     |

# Bureaucratic (Control) Mechanism

“

We get a weekly plan from our principal and **she tells us whether we're talking about assessments that week, or whether we're talking about curriculum.**

— Katie, 6<sup>th</sup> Grade

# Collegial (Commitment) Mechanism

“

**Leading** the Professional Learning Community meeting **depends on what the theme** for it is; when I'm talking about my kids, I lead the meeting and then everybody kind of pipes in and we work on things that could help with them . . . we all put in our two cents worth [input] so whether it is double scoring or talking about other kids, we all put in our ideas and then kind of come together; **it's a collaborative effort.**

— Brenda, Kindergarten Teacher

# Bureaucratic and Collegial Mechanisms Working Interdependently

“

There **are agendas set** for the PLC, that list right there. **It's mapped out per week** and then as a PLC team they **determine what to talk with**, like double scoring, what are they going to double score. **They're responsible as a grade level team for inviting a specialist** . . . math or literacy facilitator, counselor, whatever adult they think would be helpful in their brainstorming session... their input is just critical.

— Eloise, principal

## **School District Educational Infrastructure and Change at Scale: Teacher Peer Interactions and Their Beliefs About Mathematics Instruction**

**James P. Spillane**

*Northwestern University*

**Megan Hopkins**

*University of California, San Diego*

**Tracy M. Sweet**

*University of Maryland*

*While current reform efforts press for ambitious changes to teachers' instructional practice, teachers' instructional beliefs are also consequential in such efforts as beliefs shape teachers' instructional practice and their responses to instructional reforms. This article examines the relationship between teachers' instructional ties and their beliefs about mathematics instruction in one school district working to transform its approach to elementary mathematics education. Quantitative results show that while teachers' beliefs did not predict with whom they interacted about mathematics instruction, teachers' interactions with peers about mathematics instruction were associated with changes in their beliefs over time. Qualitative analysis confirms and extends these findings, revealing how system-level changes in the district's*

# School District Educational Infrastructure and Change at Scale: Teacher Peer Interactions and Their Beliefs About Mathematics Instruction

James P. Spillane  
*Northwestern University*  
 Megan Hopkins  
*University of California, San Diego*  
 Tracy M. Sweet  
*University of Maryland*

*While current reform efforts press for ambitious changes to teachers' instructional practice, teachers' instructional beliefs are also consequential in such efforts as beliefs shape teachers' instructional practice and their responses to instructional reforms. This article examines the relationship between teachers' instructional ties and their beliefs about mathematics instruction in one school district working to transform its approach to elementary mathematics education. Quantitative results show that while teachers' beliefs did not predict with whom they interacted about mathematics instruction, teachers' interactions with peers about mathematics instruction were associated with changes in their beliefs over time. Qualitative analysis confirms and extends these findings, revealing how system-level changes in the district's*

## A Shift in Teachers' Beliefs

### Results From Multilevel Models for Change in Teachers' Beliefs ( $n = 222$ )

|                            |                                | Model A  | Model B  | Model C  |
|----------------------------|--------------------------------|----------|----------|----------|
| Fixed effects              |                                |          |          |          |
| Composite model            | Intercept                      | −0.142   | −0.053   | −0.296   |
|                            | (initial status)               | (0.076)  | (0.107)  | (0.138)  |
|                            | Year                           | 0.051*   | 0.024    | 0.023    |
|                            | (rate of change)               | (0.022)  | (0.031)  | (0.030)  |
|                            | Access to peer beliefs         |          | 0.076*   | 0.081*   |
|                            | Years of experience            |          | (0.032)  | (0.032)  |
|                            |                                |          |          | −0.017** |
|                            |                                |          |          | (0.006)  |
| Variance components        |                                |          |          |          |
| Level 1                    | Within-person                  | 0.371    | 0.377    | 0.377    |
|                            |                                | (0.024)  | (0.028)  | (0.028)  |
| Level 2                    | In initial status              | 0.554    | 0.622    | 0.588    |
|                            |                                | (0.074)  | (0.100)  | (0.097)  |
|                            | In rate of change              | 0.011    | 0.001    | 0.001    |
|                            |                                | (0.006)  | (0.008)  | (0.008)  |
| Goodness-of-fit statistics |                                |          |          |          |
|                            | Akaike Information Criterion   | 1,952.57 | 1,580.32 | 1,574.89 |
|                            | Bayesian Information Criterion | 1,976.02 | 1,607.03 | 1,606.05 |

*Note.* Standard deviations in parentheses.

\* $p < .05$ . \*\* $p < .01$ .

# Lessons Learned

# Designing Educational Infrastructures to Support Instructional Innovation

- Anchored in a 'taken as shared' vision for instruction

# Designing Educational Infrastructures to Support Instructional Innovation

- Anchored in a 'taken as shared' vision for instruction
- Engages both the official and enacted curriculum

# Designing Educational Infrastructures to Support Instructional Innovation

- Anchored in a ‘taken as shared’ vision for instruction
- Engages both the official and enacted curriculum
- Allows for building shared knowledge about instruction among people

# Designing Educational Infrastructures to Support Instructional Innovation

- Anchored in a 'taken as shared' vision for instruction
- Engages both the official and enacted curriculum
- Allows for building shared knowledge about instruction among people
- Cultivates trust and interactions among staff and stakeholders

# Designing Educational Infrastructures to Support Instructional Innovation

- Anchored in a 'taken as shared' vision for instruction
- Engages both the official and enacted curriculum
- Allows for building shared knowledge about instruction among people
- Cultivates trust and interactions among staff and stakeholders
- Enables experimentation and innovation

# Designing Educational Infrastructures to Support Instructional Innovation

- Anchored in a 'taken as shared' vision for instruction
- Engages both the official and enacted curriculum
- Allows for building shared knowledge about instruction among people
- Cultivates trust and interactions among staff and stakeholders
- Enables experimentation and innovation
- Enables ongoing evaluation and improvement

# Designing Educational Infrastructures to Support Instructional Innovation

- Anchored in a 'taken as shared' vision for instruction
- Engages both the official and enacted curriculum
- Allows for building shared knowledge about instruction among people
- Cultivates trust and interactions among staff and stakeholders
- Enables experimentation and innovation
- Enables ongoing evaluation and improvement
- Supports infrastructure use in practice

# Educational Infrastructure and Instructional Improvement



Attention to how  
different components  
**interact** in practice to  
enable sense-making

# Educational Infrastructure and Instructional Improvement



Attention to how different components **interact** in practice to enable sense-making



Attention to **multiple levels simultaneously** — classroom, grade/department, school, and school system

# Educational Infrastructure and Instructional Improvement



Attention to how different components **interact** in practice to enable sense-making



Attention to **multiple levels simultaneously** — classroom, grade/department, school, and school system



Attention to regulative, normative & cultural-cognitive dimensions

# Educational System Building in Time of Covid

# Networking in Time of Covid

- Scarcity of resources
- Limited time
- Favors 'close ties' over 'weak ties'
- Building trust without in person interactions
- How can we re-frame these challenges as opportunities for building social networks to support teaching and instructional innovation?

# Disruptions Creating Possibilities

- Underscoring the need for joint work and distributed expertise
- Affirming the power of networking beyond the schoolhouse and school system
- Networking with families and communities
- Learning to appreciate the value of 'weak' ties
- How can we use these opportunities to cultivate virtual communities of practice to support teaching and instructional innovation?

# New Possibilities with Virtual Networks

- Reduce cost in terms of travel and time
- Reduce the risk of 'group think' by virtue of access to ideas beyond immediate group
- Possibility for more inclusiveness in terms of participants
- Potential to reduce inequities in access to ideas and information
- How do boundary practices, boundary spanners, and boundary objects work similarly and differently in virtual networks compared with face-to-face networks?

# Developing & Maintaining Virtual Networks

- Nonverbal cues more difficult to notice
- Passive participation easier in virtual communities
- Not all 'virtual' spaces are equal
- Vicarious participation has advantages
- Beyond virtual vs face-to-face networks
- How can we combine face-to-face and virtual networking in ways that cultivate and channel relationships essential for supporting teaching and enabling instructional innovation?

# In Conclusion

- Implementation and Institutionalization takes a System
- Educational System building involves building educational infrastructures that
  - Create and maintain **boundary practices** among different 'Communities of Practice' in an education system
  - Provide **boundary objects** that anchor interactions among participants in boundary practices
  - Develop and mobilize **boundary spanners** to support interactions among participants in boundary practices



# Thank you !



@jamespspillane



j-spillane@northwestern.edu



[www.distributedleadership.org](http://www.distributedleadership.org)