

Designing Educational Infrastructures for Collaboration: The Real Challenge of Instructional Innovation

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Queensland Principals' Conference,
Brisbane, February 27, 2015

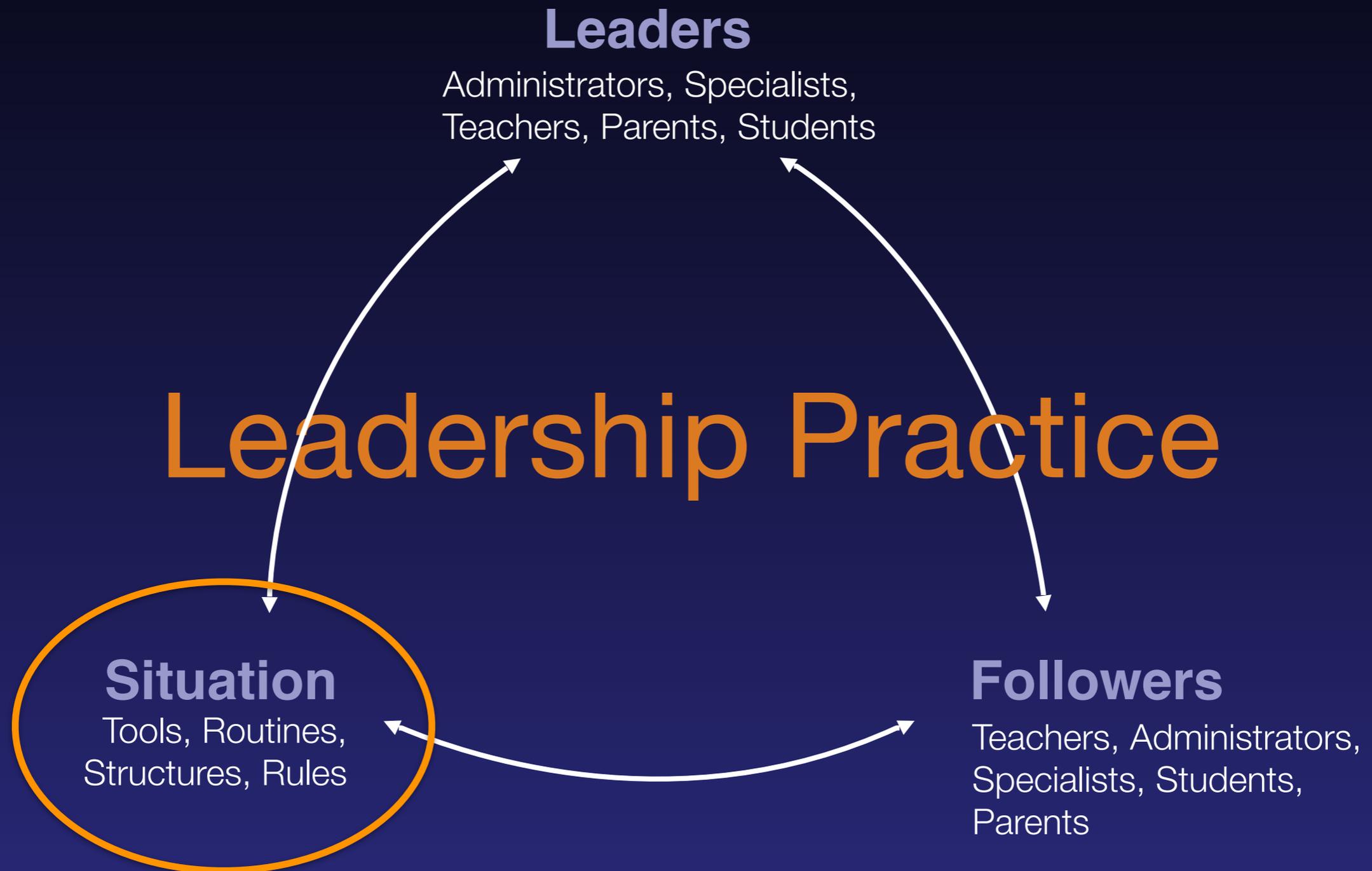
The Distributed Leadership Studies
<http://www.distributedleadership.org>

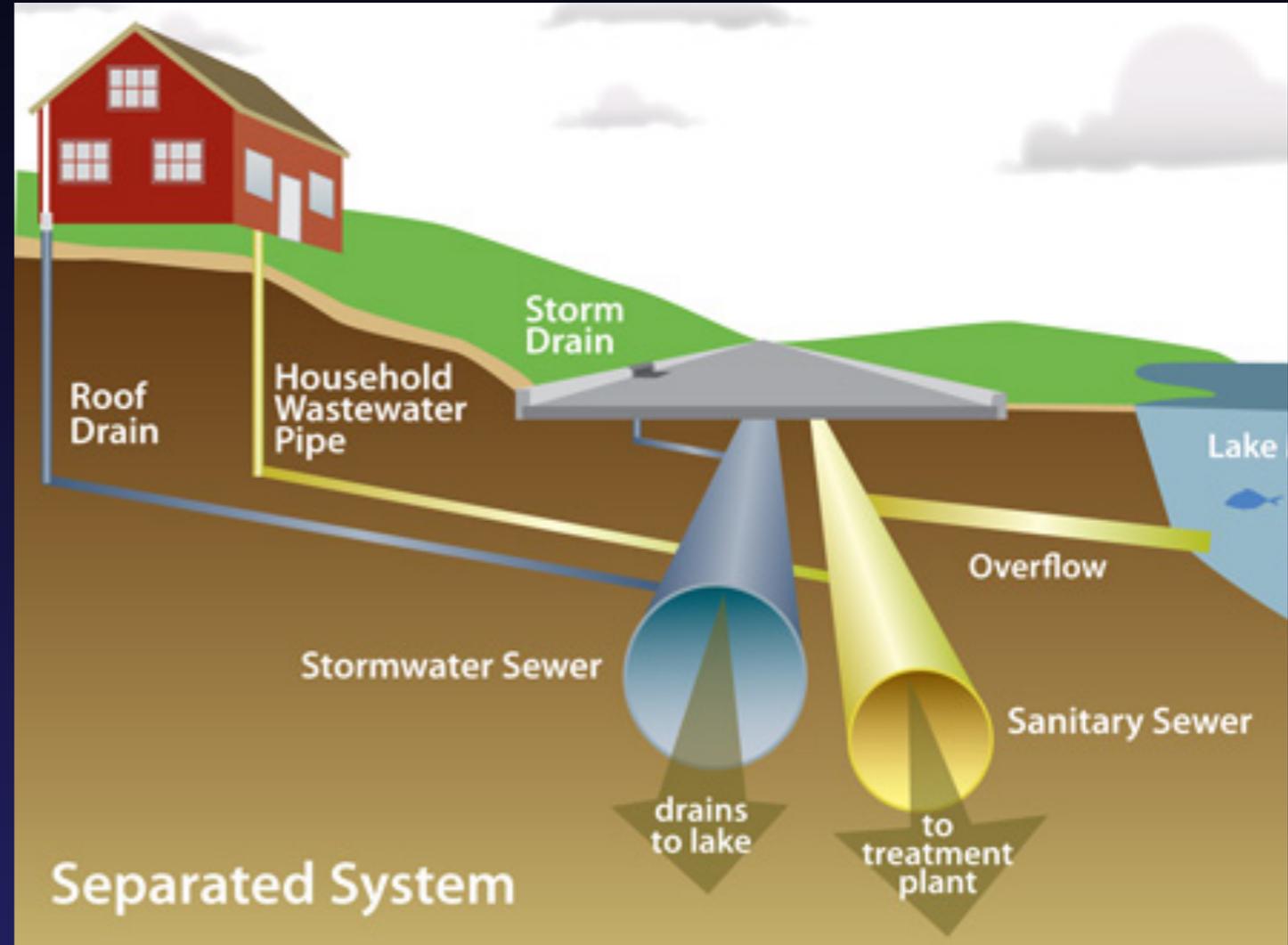
Funded by National Science Foundation, Spencer Foundation, Institute for Education Sciences, & Carnegie Corporation

Diagnosis and Design from a Distributed Perspective: Individuals and Infrastructure



Diagnosis and Design from a Distributed Perspective: Individuals and Infrastructure





School System and School Organizational Infrastructure

- **Infrastructure** refers to those structures and resources that are mobilized by school systems and school organizations to enable (and constrain) classroom teaching, maintain instructional quality, and lead instructional innovation
- **Infrastructure includes:**
 - the educational infrastructure - the instruments and tools that are the materials of instruction
 - the formal organizational infrastructure - formal positions, routines, rules, and regulations
 - the social infrastructure - people and their capability

DESIGNED
Formal positions, organizational routines as represented in formal documents and accounts

VS

LIVED
Organization as experienced in day-to-day life of organizational members

CONCEPTS
NORMS
SCRIPTS
POLICIES
SCRIPTS
TOOLS
PROCEDURES
STRUCTURE
WORK
FRAMES
CONCEPTS
POSITIONS
ORGANIZATIONAL
ROUTINES
REGULATIONS
FRAMES
POSITIONS
PROGRAMS
WORK
SCRIPTS
RULES
PROCEDURES
ORGANIZATIONAL
ROUTINES
RULES
POSITIONS

Organizational Routines

- **Organizational Routines:** “repetitive, recognizable patterns of interdependent actions carried out by multiple actors” (*Feldman & Pentland, 2003*)
 - **Ostensive Aspect:** Ideal form — general idea or script of the routine
 - **Performative Aspect:** Routine in practice in particular places, at particular times
- **Concerns about the organizational routine construct — rigid, mundane, mindless, explicitly stored** (*Cohen, 2007*)

Organizational Routines

- **Advantages**

- **Allow efficient coordinated action**
- **Provide source of stability**
- **Reduce conflict about how to do work**

- **Disadvantages**

- **Result in inappropriate responses**
- **Inertia, mindlessness, and de-motivation**

Embracing Design: Leading & Managing Instructional Innovation by Designing Organizational Routines

- **Adams School:** Breakfast Club, Grade Level Meetings, Teacher Talk, Teacher Leaders, Five-Week Assessment, Literacy Committee, and Mathematics Committee
- **Baxter School:** Cycle Meetings, Leadership Team Meetings, Literacy Committee, Math/Science Committee
- **Kosten School:** Report Card Review, Grade Book Review, Lesson Plan Review, Faculty Meetings, Grade Level Meetings
- **Kelly School:** Skill Chart Review, Professional Development

Designing Organizational Routines to Address Core Organizational Functions

	Functions	Tools	People
Five Week Assessment	<ul style="list-style-type: none"> -Formative Evaluation -Teacher Accountability -Monitor Instruction -Teacher Development 	<ul style="list-style-type: none"> -Standardized Tests -Standards -Student Assessments 	<ul style="list-style-type: none"> -Language Arts Coordinator -Assistant Principal -Principal -Teachers
Breakfast Club	<ul style="list-style-type: none"> -Teacher Development -Build Professional Community 	<ul style="list-style-type: none"> -Research Articles 	<ul style="list-style-type: none"> -Teachers -Language Arts Coordinator -Principal
School Improvement Planning (SIP)	<ul style="list-style-type: none"> -Identify Instructional Priorities & Resources 	<ul style="list-style-type: none"> -Previous Year SIP -District Guidelines -Test Score Data 	<ul style="list-style-type: none"> -Principal -Administration -Teachers (approved LSC)
Classroom Observations	<ul style="list-style-type: none"> -Teacher Development -Monitor Instruction -Accountability 	<ul style="list-style-type: none"> -School Protocol, -District Protocol 	<ul style="list-style-type: none"> -Principal -Assistant Principal
Real Men Read	<ul style="list-style-type: none"> -Student Motivation and Support 	<ul style="list-style-type: none"> -Books 	<ul style="list-style-type: none"> -Language Arts Co-ord. -Assistant Principal -Principal -Community Members

Changing Organizational Routines, Changing Interactions Among Staff

“You close your door. You do what you want. You don’t know what everybody else is doing and it’s fine. Nobody is interested. Nobody’s checking on you or even interested in what you are doing . . . but it changed since then. We work much closer together ... First of all, we probably were forced to do some exchange of ideas in—when it first started. Then people found it’s very helpful and nobody keeping anything as a secret so we share freely. And it helps. (Teacher Interview)

Diagnosis and Design Work: Asking the Difficult Questions about Organizational Routines

- **What is the theory of action behind the routine?**
- **What arguments explain and evaluate the routine?**
 - **Why should it work?**
 - **Why might it not work?**
 - **What are the advantages of this routine?**
 - **What are the disadvantages of this routine?**
- **How is the routine connecting with/anchored in teaching and learning?**



Task One: Organizational Routines

- **Identify one core organizational routine in your organization or school system for enabling instructional innovation.**
- **Jot down the components of the routine**
 - **What is the theory of action for this routine?**
 - **How might it work? How might it not work?**
- **Discuss your routine with the person next to you**

Social Interactions and Resources for Instructional Innovation

- **Social relations are a source of resources such as ideas, trust, and incentives to innovate**
- **On-the-job interactions can enable transfer of advice and information essential for developing knowledge about instruction**
- **New knowledge critical ingredient for innovation**

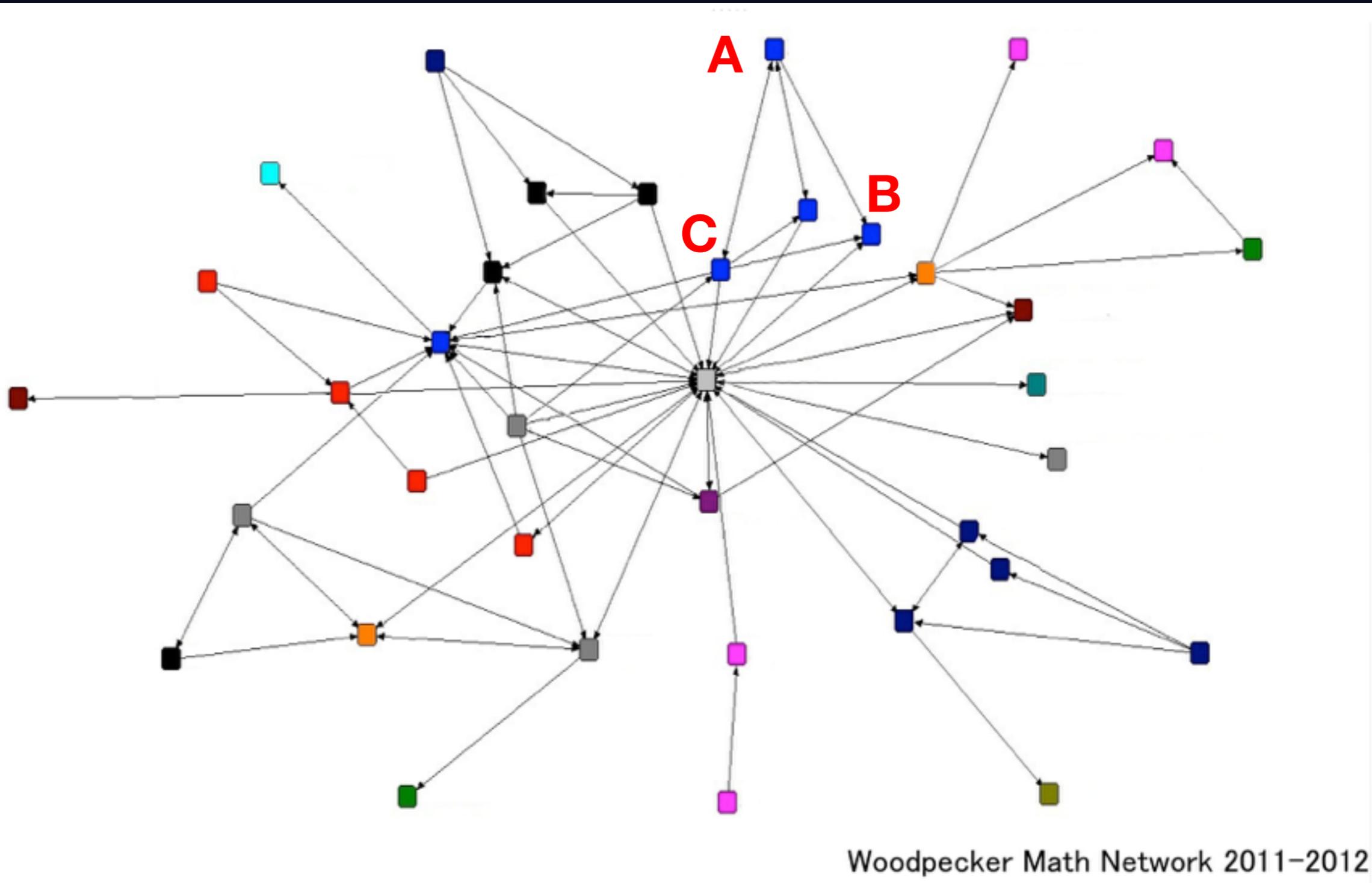
Blau, 1957; Bryk & Schneider, 2002; Coburn, 2001; Daly & Finnigan, 2010; Elmore, 1996; Eraut & Hirsh, 2007; Frank, Zhao, & Borman, 2004; Hill, 2004; Little, 2002; Smylie, 1995; Spillane, 2004

Knowledge Development Processes

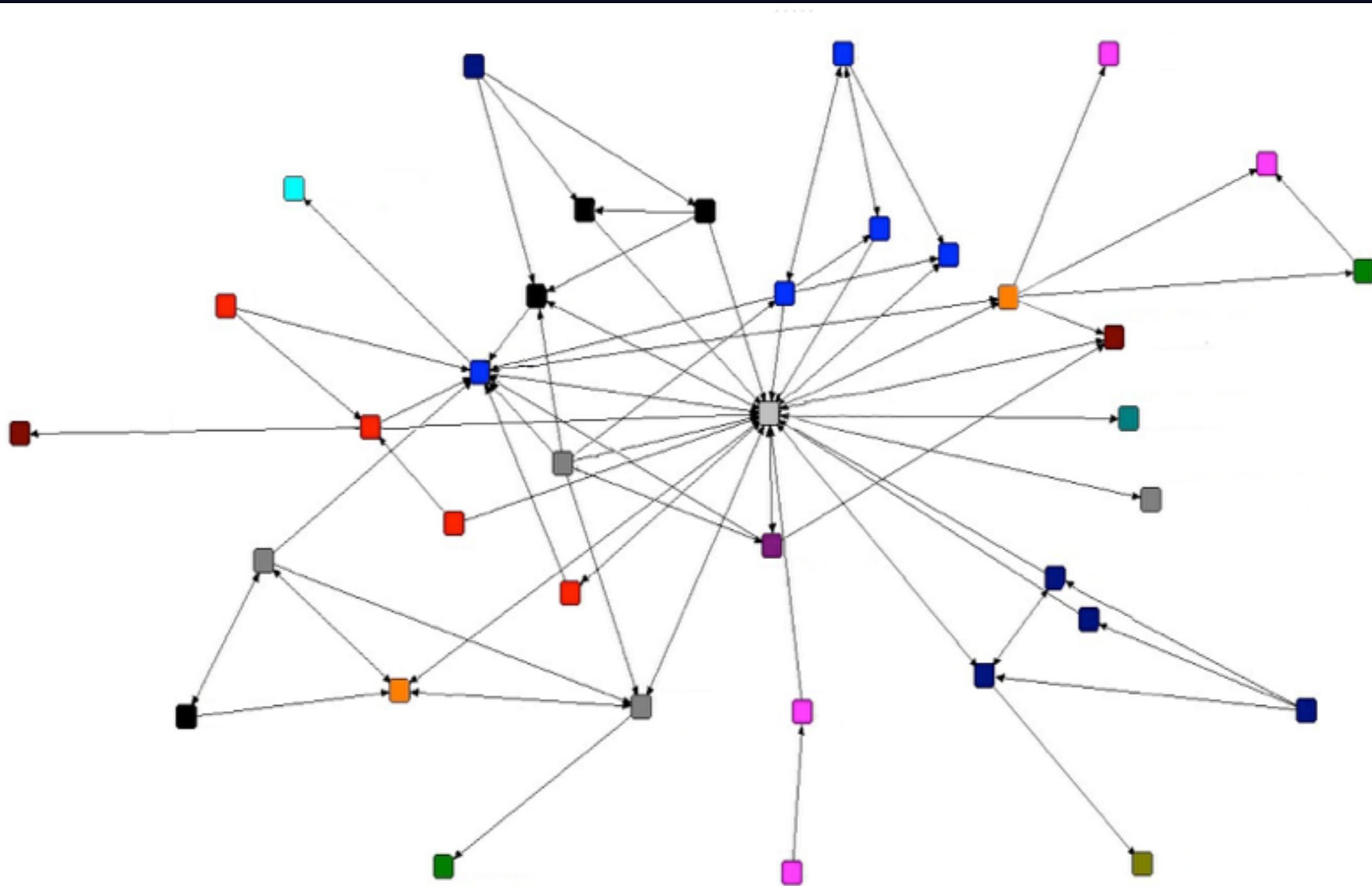
- **On-the-job interactions associated with the transfer of advice and information — essential to knowledge development**
 - **Socialization: Tacit Knowledge — Tacit Knowledge**
 - **Externalization: Tacit Knowledge — Explicit Knowledge**
 - **Combination: Explicit Knowledge — Explicit Knowledge**
 - **Internalization: Explicit Knowledge — Tacit Knowledge**

Choo, C. W. (1998). *The Knowing Organization: How Organizations Use Information to Construct Meaning, Create Knowledge, and Make Decisions*. New York: Oxford University Press.

Examining Interactions about Mathematics Instruction

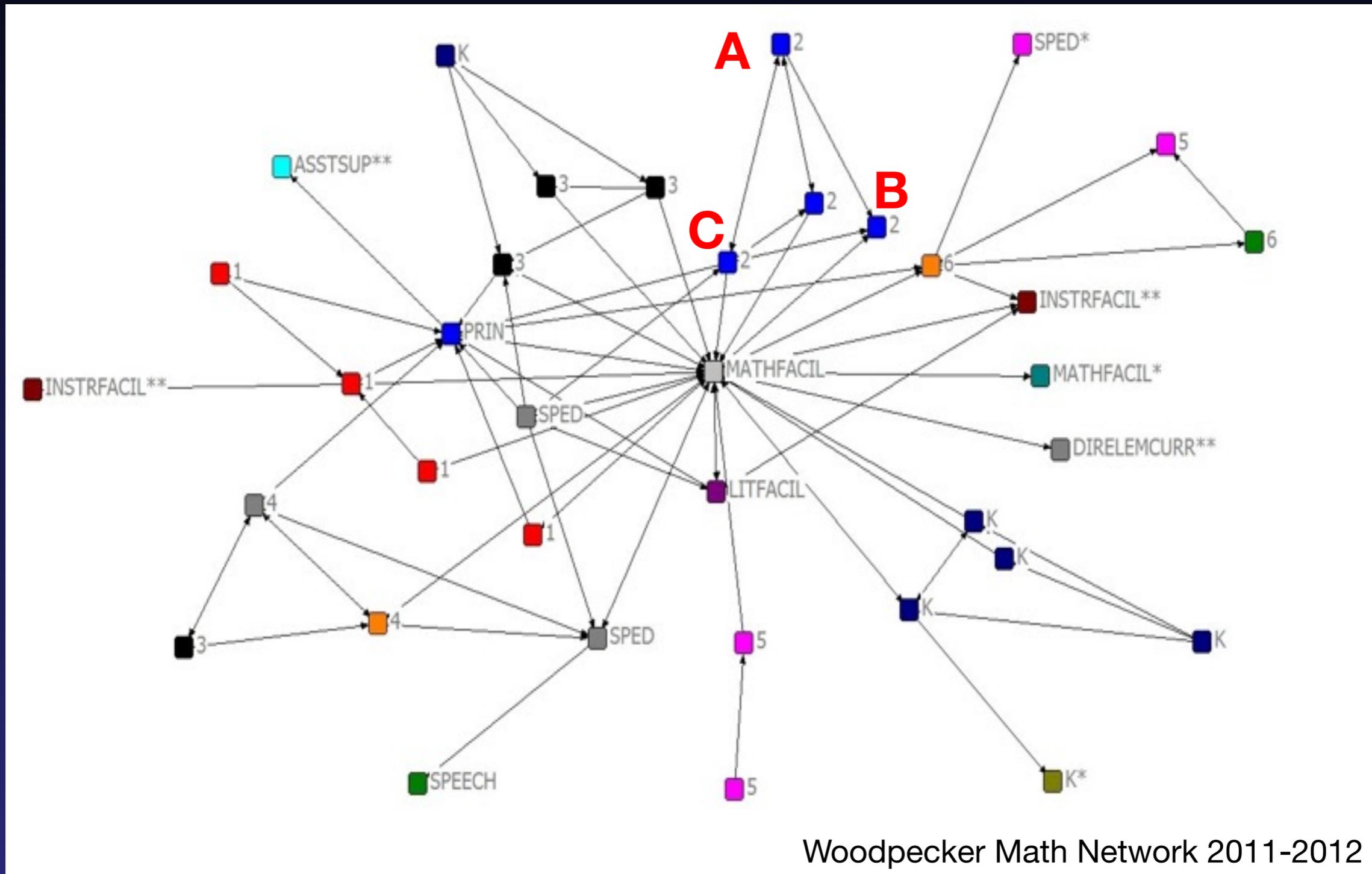


Task Two: Examining Interactions about Mathematics Instruction

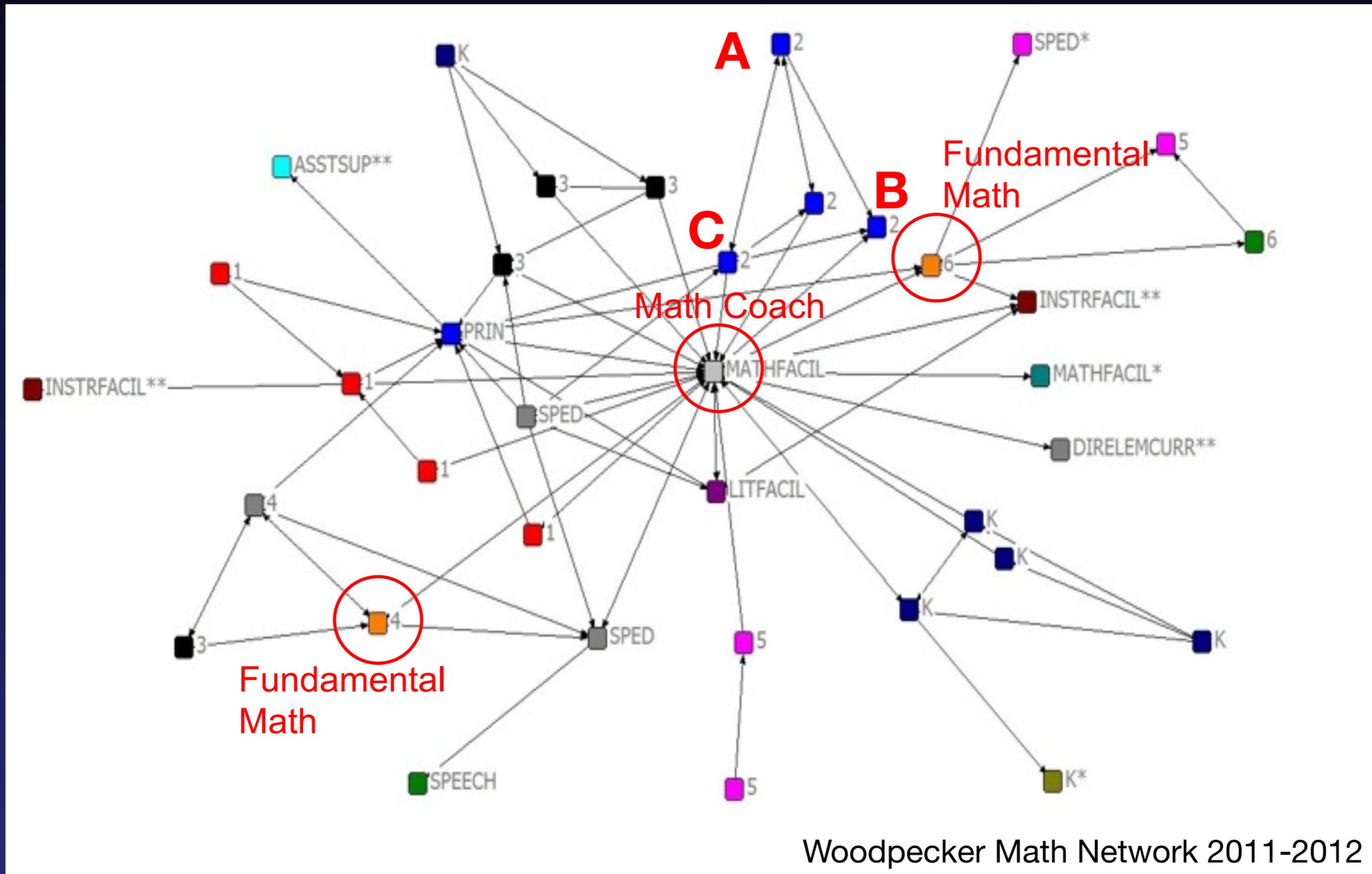


Woodpecker Math Network 2011-2012

Task Two: Examining Interactions about Mathematics Instruction



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Study One: Organizational Infrastructure and Instructional Interactions

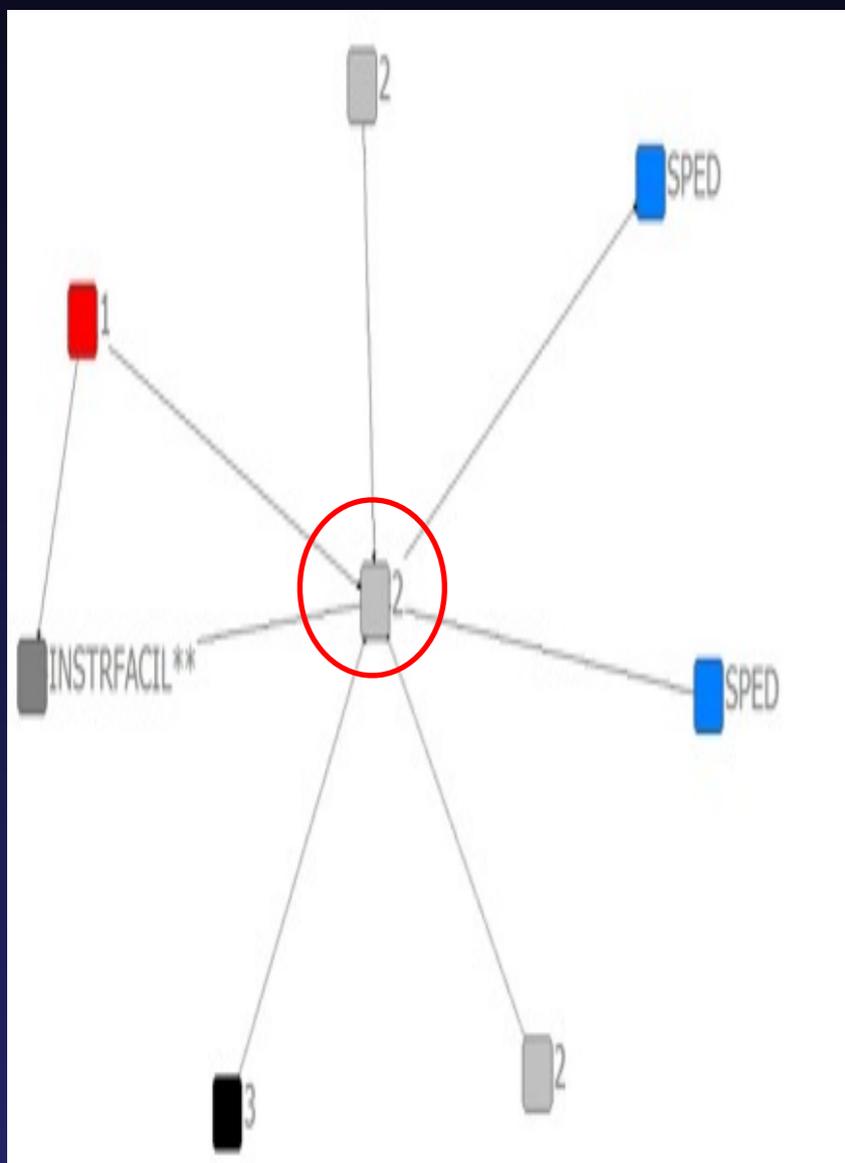
- Teachers more likely to seek advice from others of **same gender and race**
- **Prior tie** strongly associated with having a current tie
- **Formal** leaders more likely to provide advice or information
- Teachers in the **same grade** more likely to receive or provide advice or information
- Teachers more likely to seek advice about a subject from teachers who reported **more PD** in that subject

Spillane, J. P., Kim, C. M., & Frank, K. A. (2012). Instructional advice and information seeking behavior in elementary schools: Exploring tie formation as a building block in social capital development. *American Educational Research Journal*, 49(6), 1112-1145.

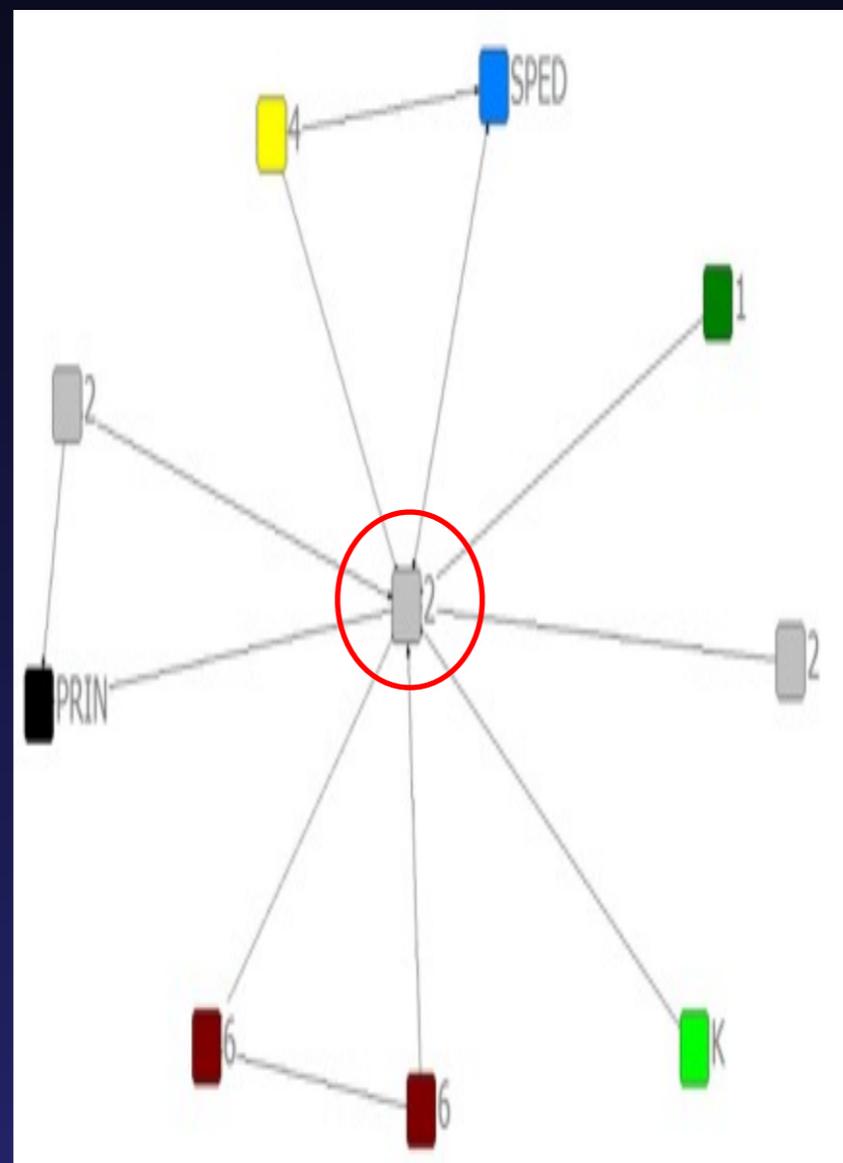
System & Organizational Educational Infrastructure Redesign: The Case of One Local School District

- **New mathematics curriculum**
- **Investing in professional development of teacher leaders for mathematics**
- **Strategic selection of teacher leaders**
- **Creation of math coach position in some schools**
- **Designed system and school organizational routines, e.g.,**
 - **Toolbox for mathematics**
 - **Professional Learning Communities**
 - **Grade level team meeting**

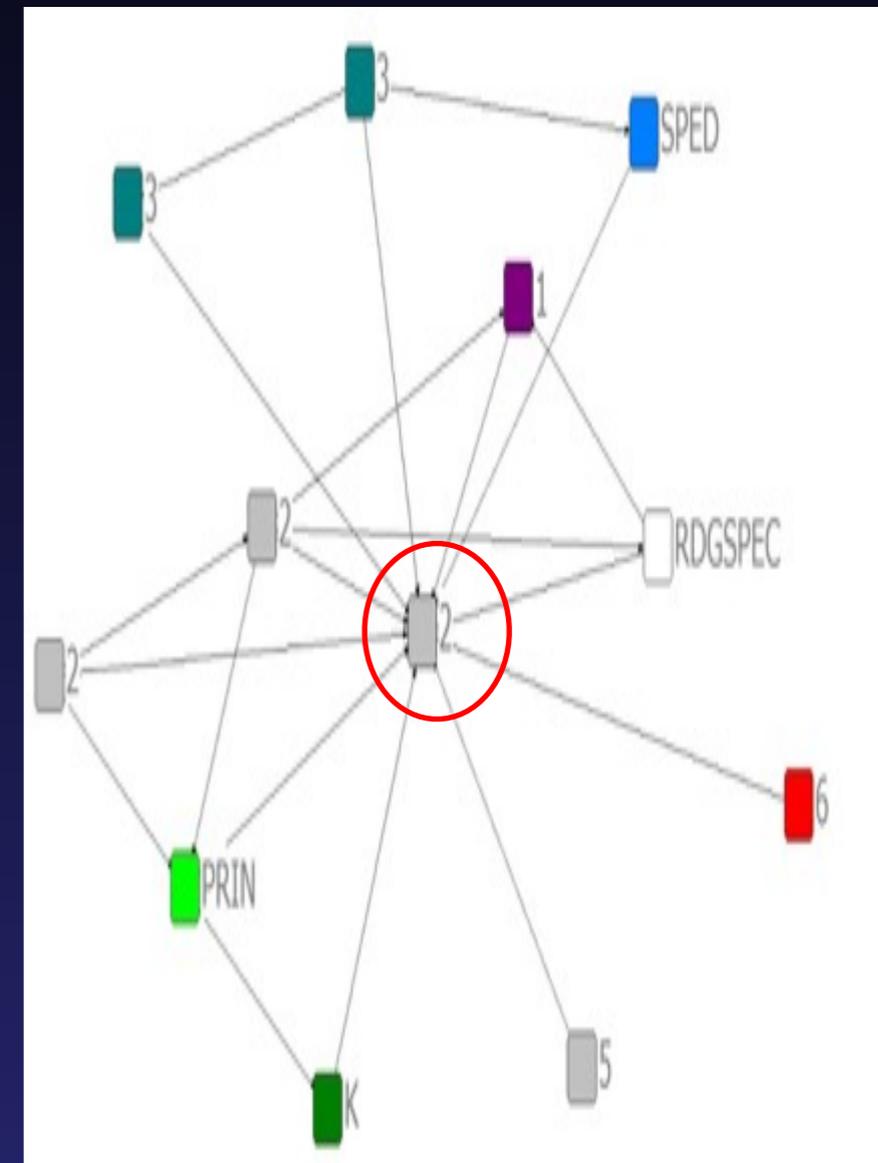
Math Teacher Leaders and Interactions about Mathematics Teaching & Learning



2009-10



2010-11



2011-12

Teacher Leadership and Training as a Marker of Expertise

Karen
(1st grade)

“Because he’s a second grade teacher....He’s kind of become the math person to see because he’s taken this extra training that nobody else in the building has done, and I know that he’s interested in math so, he’s just one that I’ve gone to that I know focuses very heavily on, I like his beliefs and the way that he has his room set up and the way that he carries himself.”

Teacher Leadership and Training as a Marker of Expertise

Angie
(Special Education)

“[Emily] really wasn’t our facilitator [last year], though she was my co-worker, just a third grade teacher. I knew she had a wealth of knowledge, I just wasn’t in [her classroom] when she was teaching math. But, now that she’s moved into this math facilitator position, that’s different... She’s been trained in it. And, she’s gone to school for it and she’s a great coach. She knows a lot about math and I trust her that she has a lot of, a wealth of knowledge... She’s the go-to person.”

Organizational Routines and Expertise

“We have had that benefit of having [Gabrielle] on the [district] toolbox [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 kinda felt more in the math loop than maybe some of the other teams who don't have that connection piece of somebody on the toolbox in their building.”

Clarissa (1st grade)

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

Rachel (Kindergarten)

Infrastructure Redesign Promoted Advice and Information Seeking in Mathematics

Average In-Degree for Teacher Leaders and Other Teachers, Auburn Park School District

	2009-10	2010-11	2011-12
Toolbox Members (6)	1.60	2.80	2.67
Fundamental Math Participants (9)	4.33	6.00*	6.00
Math Coaches (3)	6.33	16.33**	18.00
Other Teachers (256)	1.54	1.60	1.36

Infrastructure Redesign Promoted Brokering in Mathematics

Average Betweenness for Teacher Leaders and Other Teachers, Auburn Park School District

	2009-10	2010-11	2011-12
Toolbox Members (6)	5.00	75.80*	48.86
Fundamental Math Participants (9)	32.44	144.33*	115.42
Math Coaches (3)	38.67	248.67**	222.97
Other Teachers (256)	10.85	24.81*	11.90

System and Organizational Infrastructure & Teachers' Instructional Beliefs and Practice

Change in Teachers' Beliefs about and Reported Practices in Mathematics

	2009-10	2010-11	2011-12
Beliefs about Mathematics Instruction Mean (SD)	3.35 (0.5)	3.46*** (0.5)	3.51*** (0.5)
Reasoning and Problem-Solving Practices Mean (SD)	2.39 (0.4)	2.52*** (0.4)	2.64*** (0.5)

Notes: Means are based on teachers from 12 schools with over 70% response rates who responded in every year of the survey. Significant differences are for comparisons to 2009-10. *** $p < .001$; ** $p < .01$, * $p < .05$; + $p < .10$

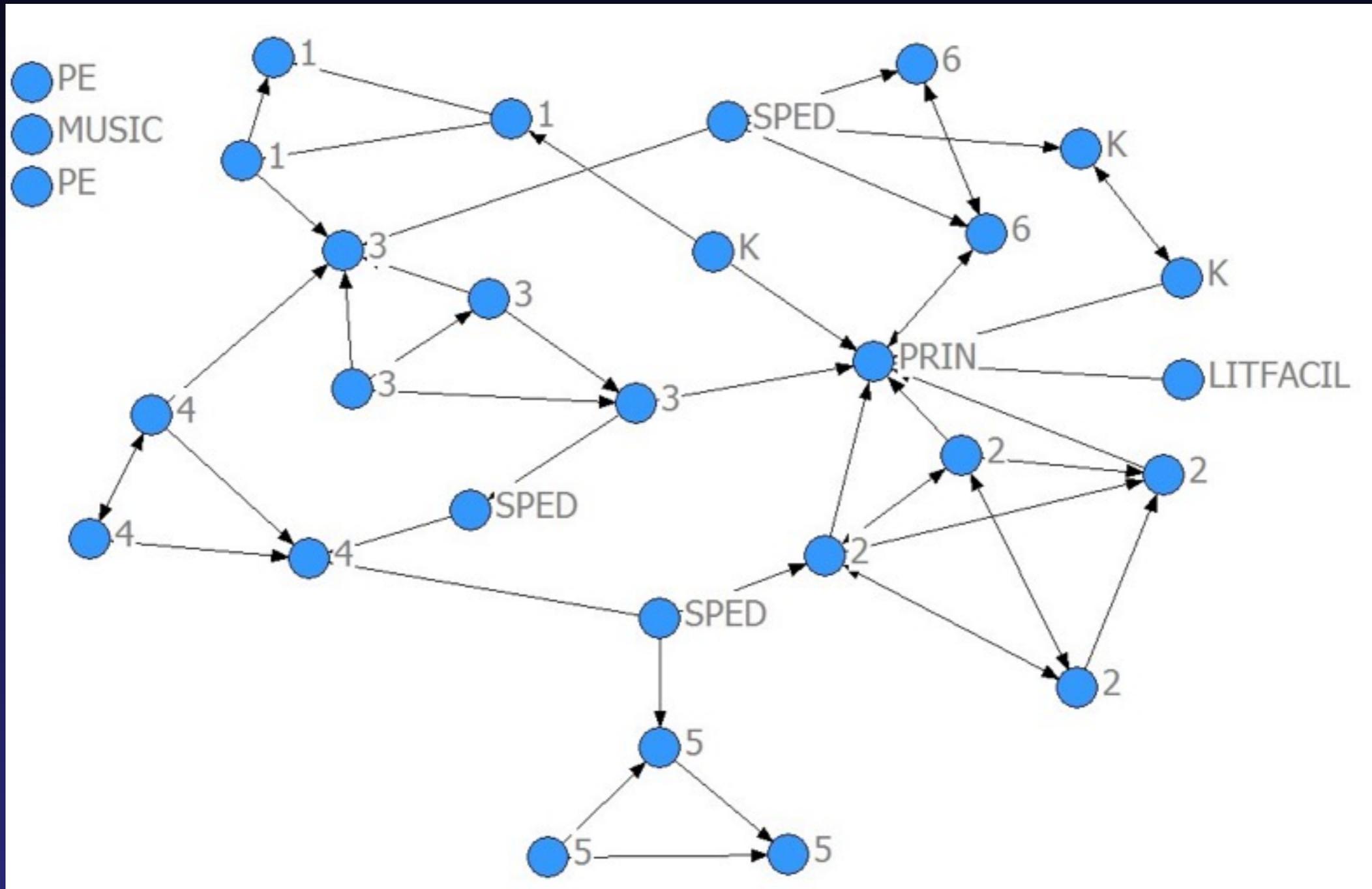
Infrastructure ALSO Matters for INTER/ BETWEEN School Interactions about Instruction

- Individual characteristics are associated with advice and information ties in schools
- Aspects of the **formal organization** are more strongly associated with *between* school ties:
 - Formal leadership position: **More likely** to have a tie
 - Subject-specific leadership position: **More likely** to have a tie
- **Formal leadership position** predicted instructional advice and information ties between schools more than anything else

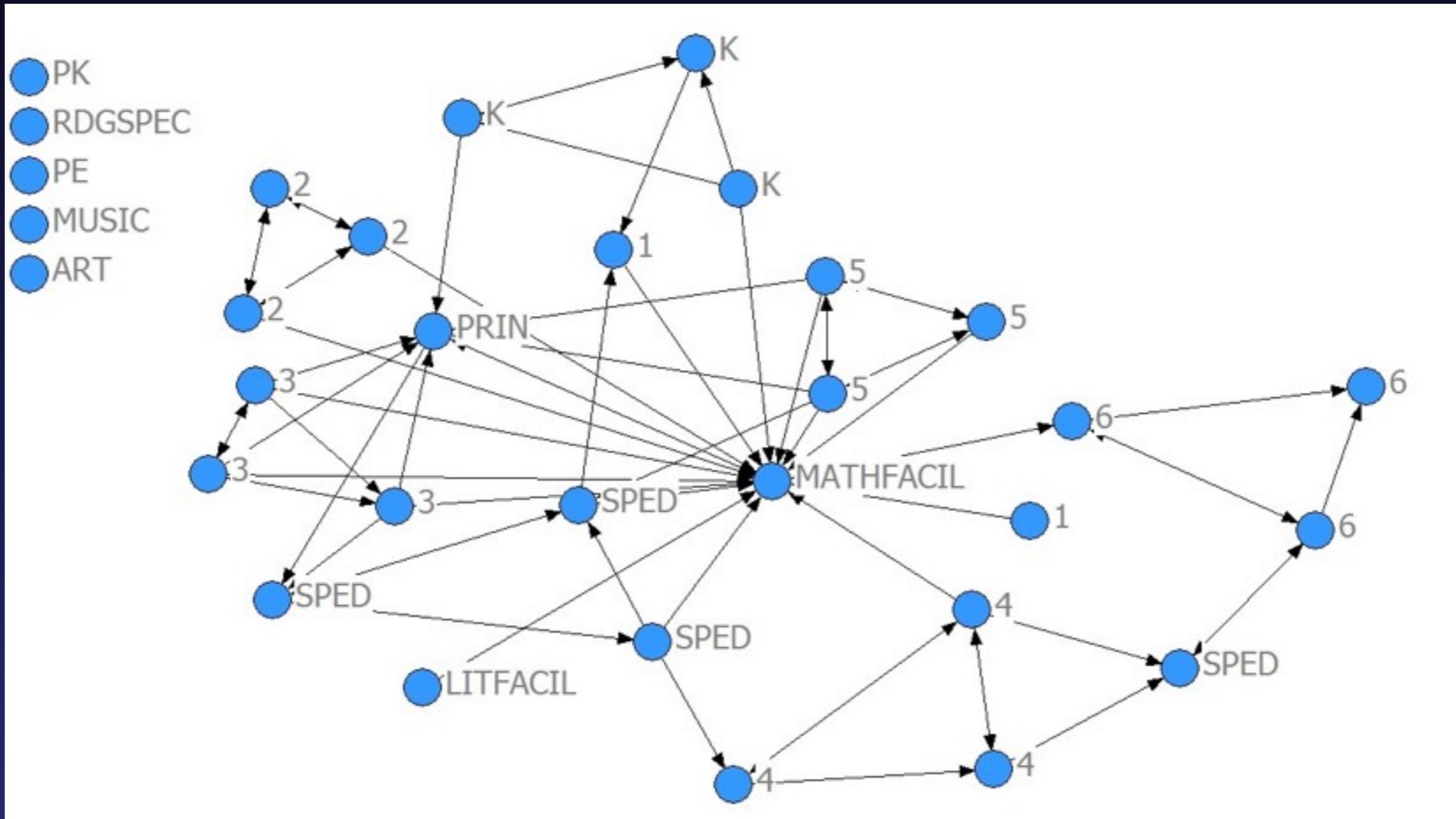
Task Three: Doing Diagnostic Work on Instructional Interactions (Primary School)

- **Imagine you are introducing a new mathematics curriculum in Kingsley, Chamberlain, and Bryant elementary schools. Compare the mathematics networks among the schools.**
 - **Identify one difference between any two schools relevant to introducing a new curriculum in mathematics.**
 - **How might your strategies for introducing a new math curriculum differ among these schools?**
 - **How might you build ties between the three schools to support mathematics instruction?**

Chamberlain Elementary Mathematics Network



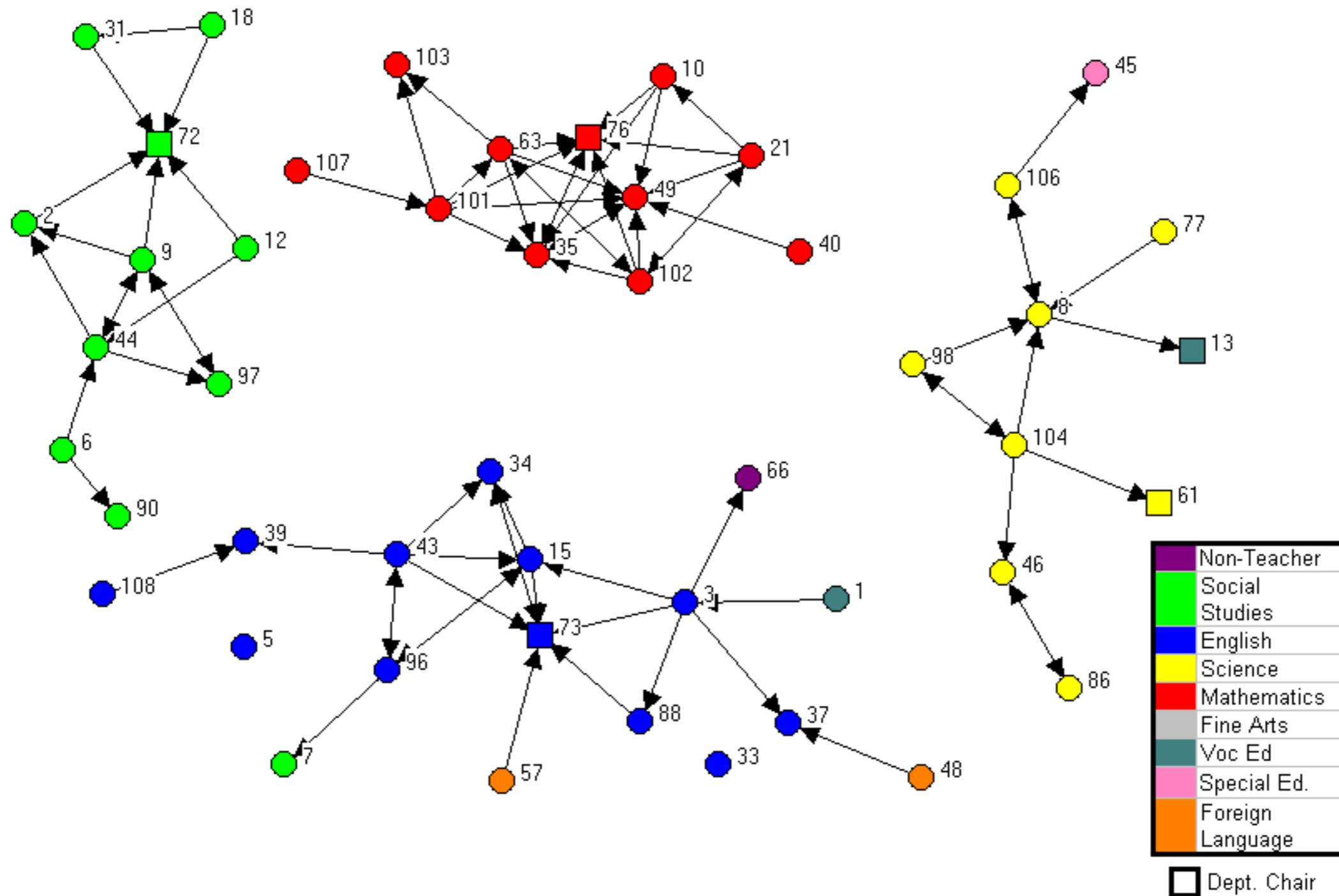
Bryant Elementary Mathematics Network



Task Three: Doing Diagnostic Work on Instructional Interactions (Secondary School)

- **Imagine you are introducing a new program to teach reading across the curriculum/disciplines in Pink Hamlet and Fern Hill High Schools. Examine the curriculum advice networks in the two high schools**
 - **What patterns do you notice that might be relevant to your program implementation efforts?**
 - **Identify two differences between the schools that you would consider in your implementation efforts?**

Pink Hamlet High School Curriculum Network



Some Lessons about Social Interactions & Knowledge Development

- **Strong ties - enable the transfer of tacit, complex knowledge and facilitate joint problem solving**
- **Weak ties - enable the transfer of explicit knowledge**
- **Ties that span organizational boundaries allow for new information and minimize 'group think'**
- **Boundary spanners — individuals that connect different subgroups — facilitate the implementation of new approaches.**
- **Trust enables learning from social interactions**

Concluding on a Cautionary Note



What about Infrastructure Matters for Instructional Interactions

- **Coherence or alignment**
- **Specificity**
- **Authority and power**
- **Cognitive adequacy**
- **Corruptibility and correctability**

Moving Forward

- **Diagnosis and design are essential in leading instructional innovation and managing instructional quality**
- **To do diagnostic and design work well, we need a framework to guide our efforts**
- **A distributed framework focuses our efforts on the practice of leading and managing**
- **The practice of leading and managing is where the rubber of system and school leadership and management meets the road of instructional innovation**

More At:

- <http://www.distributedleadership.org>
- <http://distributedleadership.org/DLS/Presentations.html>