What Does It Mean To Do Lesson Study "Right?"

A Theory of Action For Lesson Study

Chicago, April 29, 2010

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This material is based upon work supported by the National Science Foundation under Grant No. 0207259. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

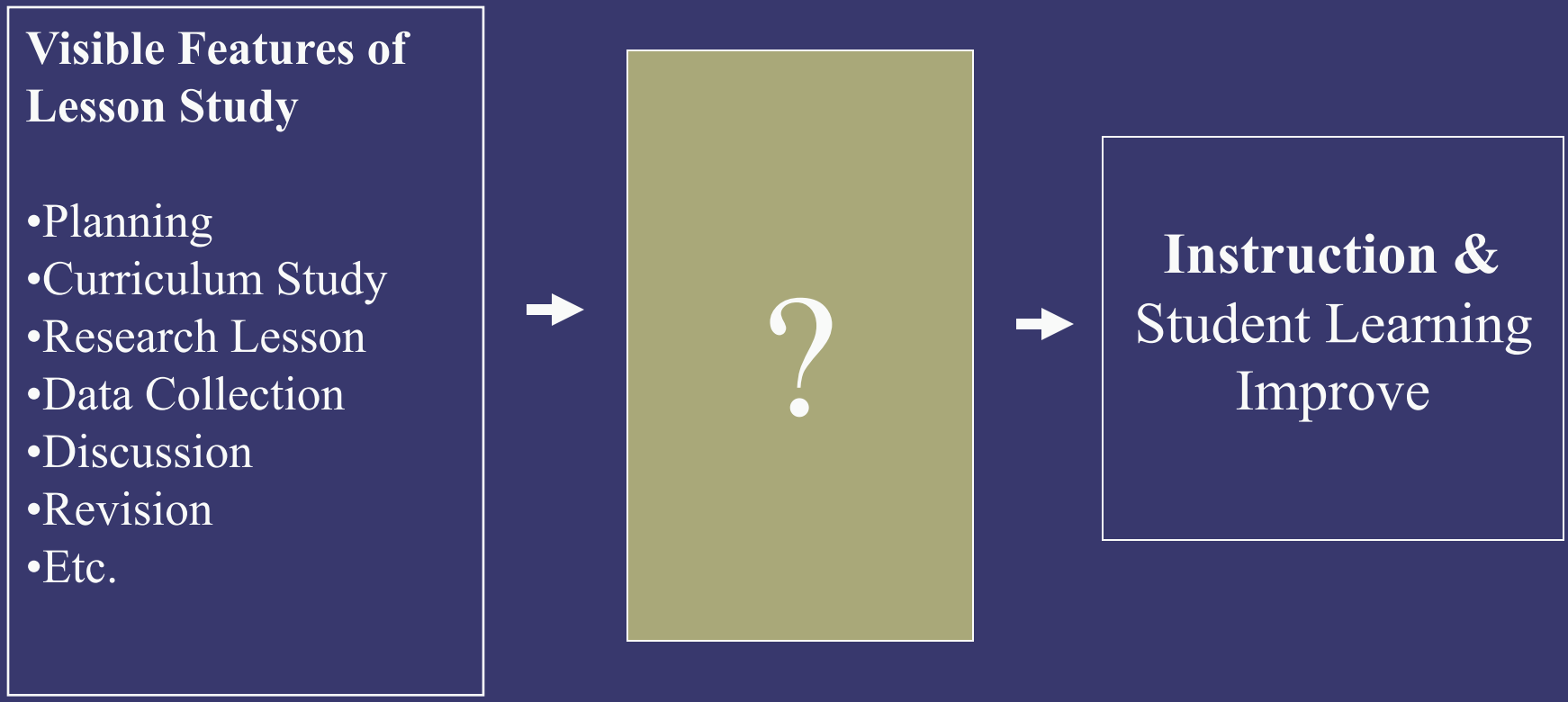
This material is based upon research supported by the Department of Education Institute for Education Sciences, Grant No. R308A960003. Any opinions, findings, and conclusions or recommendations expressed in this website are those of the authors and do not necessarily reflect the views of the grantors.

Lesson Study as Sushi

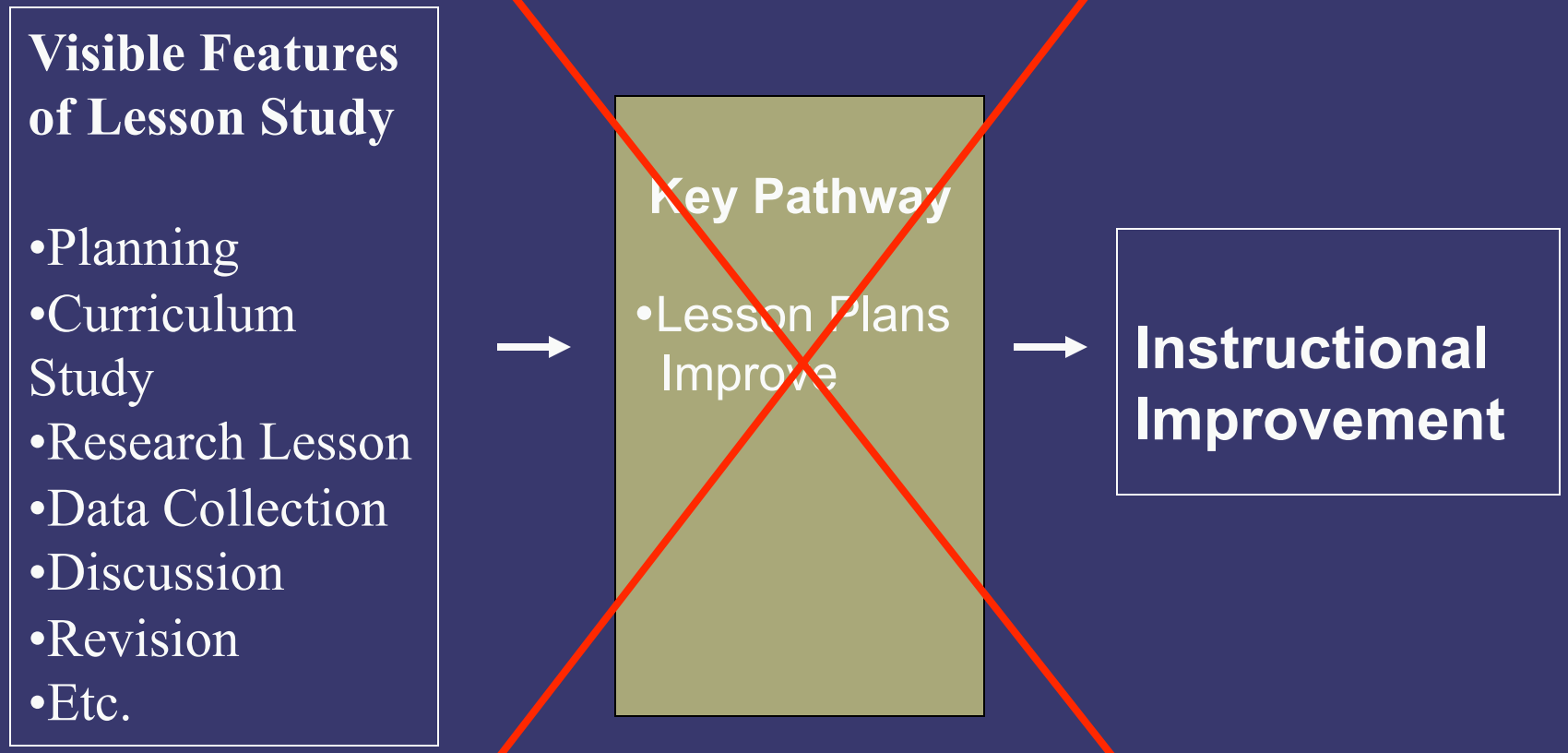
California Roll or
Peanut Butter Sushi?

How do we know?

How does lesson study improve instruction?



A Common Conception of Lesson Study



How does lesson study improve instruction?

Reflect & Record Your Lesson Study Experiences

How has lesson study affected:

- Your knowledge (about content, teaching, curriculum, student thinking…)

- Your beliefs, skills, dispositions

- Your professional community–relationships with other educators

- Lesson plans, materials, tasks, tools

Knowledge

- Subject Matter
- Pedagogy
- Student Thinking
- Curriculum, Standards, Tasks

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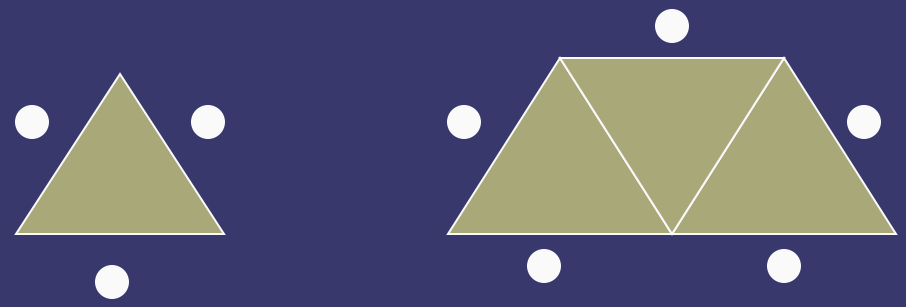
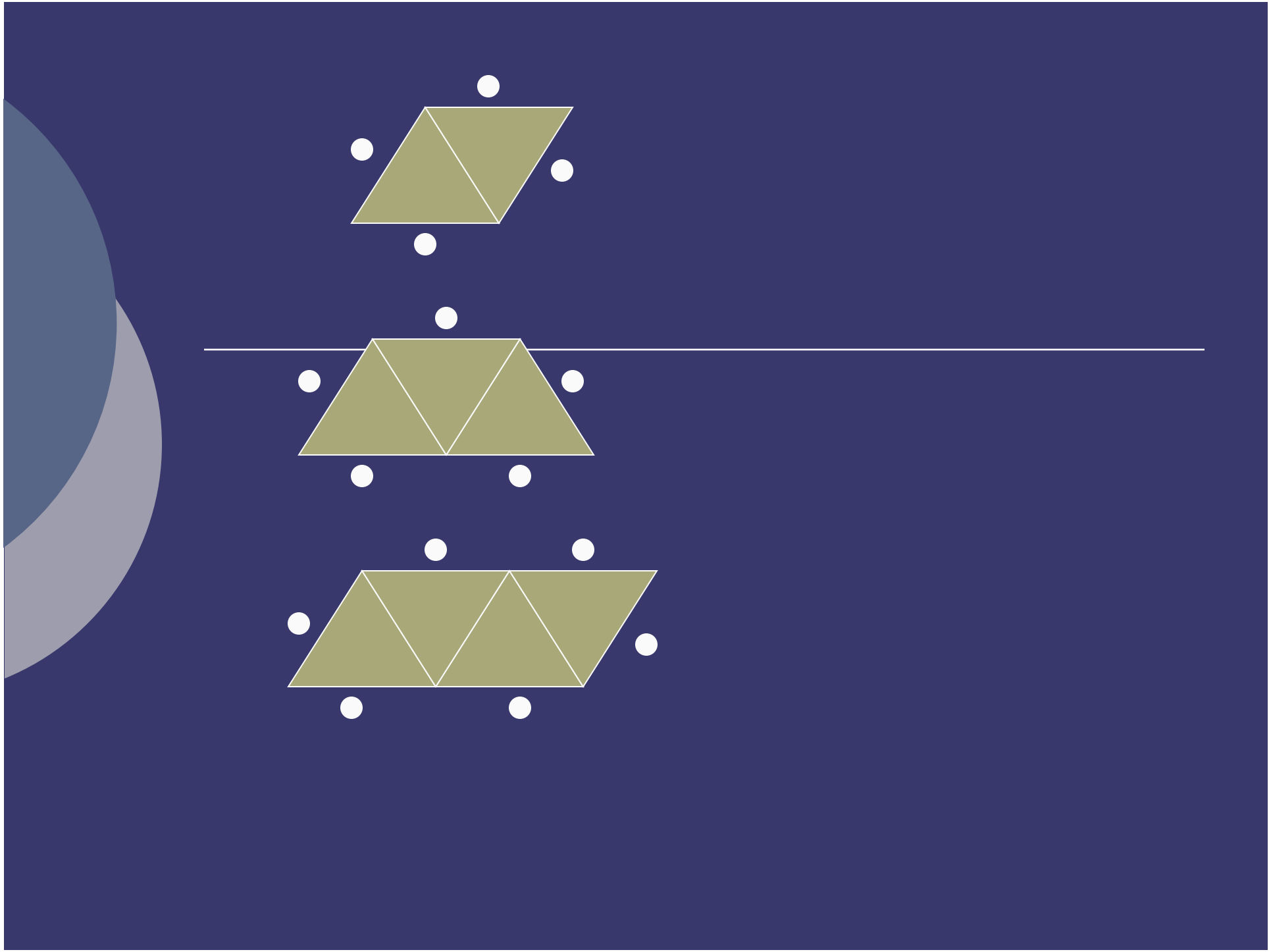
Examples of all of these can be found in DVD “How many seats?” (Lewis, Perry & Hurd 2009)

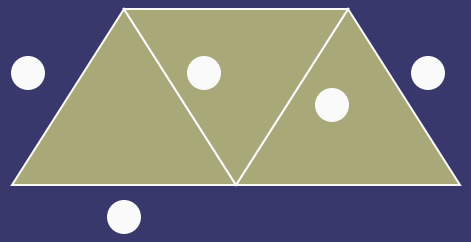
Can patterns help us find an easy way to answer the question:

How many seats fit around any number of triangles, arranged in a row as shown?

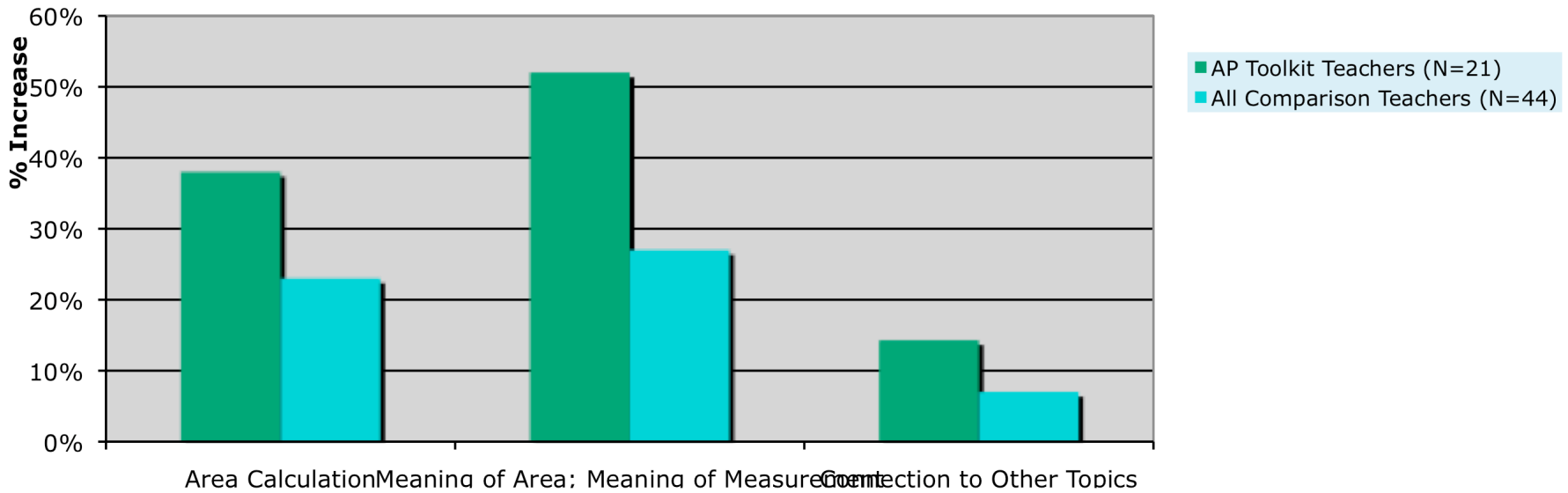


INPUT Number of Triangle Tables	**OUTPUT** Number of Seats
1	3
2	4
3	
4	
5	
6	





What Teachers Think Students Need to Understand about Area of Rectangles - Increase in Use of Coding Category Pre- to Posttest



Knowledge

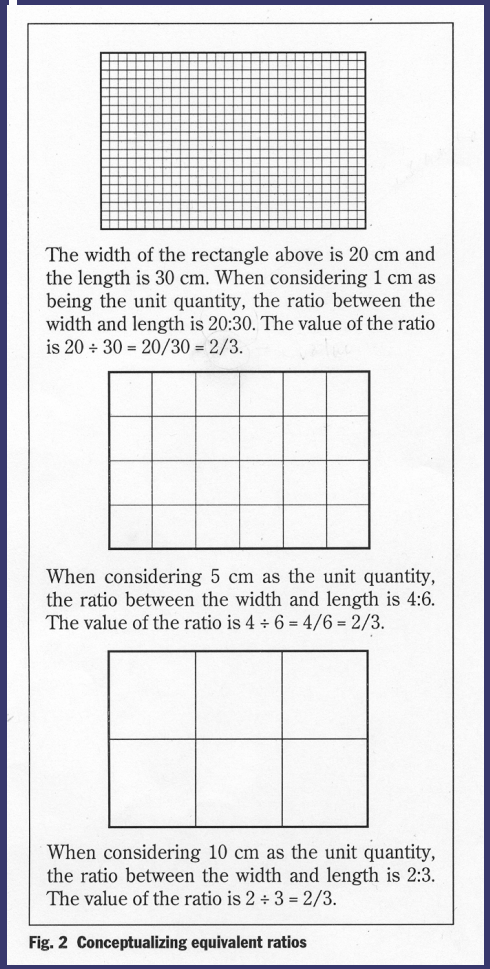
- Subject Matter
- Pedagogy
- Student Thinking
- Curriculum, Standards, Tasks

How do you design lesson study to support teachers' development of this knowledge?

Improving the Impact of Lesson Study on Teachers' Knowledge

- Solve and discuss math problems (or tasks from other disciplines)
- Study and compare high-quality curricula
- Consult a knowledgeable other
- Read research (especially on student thinking)
- Gather data about student thinking early in the process, to inform planning
- Consolidate and write up your learning

Asian Curriculum



The width of the rectangle above is 20 cm and the length is 30 cm. When considering 1 cm as being the unit quantity, the ratio between the width and length is 20:30. The value of the ratio is 20 ÷ 30 = 20/30 = 2/3.

When considering 5 cm as the unit quantity, the ratio between the width and length is 4:6. The value of the ratio is 4 ÷ 6 = 4/6 = 2/3.

When considering 10 cm as the unit quantity, the ratio between the width and length is 2:3. The value of the ratio is 2 ÷ 3 = 2/3.

Fig. 2 Conceptualizing equivalent ratios

- Ratio of rectangle width to length using 1-, 5- or 10- cm square units,
- 2:3, 4:6, 20:30

(Lo, Watanabe, & Cai, 2004)

US Curriculum

- May present standard cross-multiply and divide algorithm

(McDougall Littell, 2004)

EXAMPLE 1 Using the Cross Products Property

Use the cross products property to solve the proportion $\frac{3}{m} = \frac{5}{15}$.

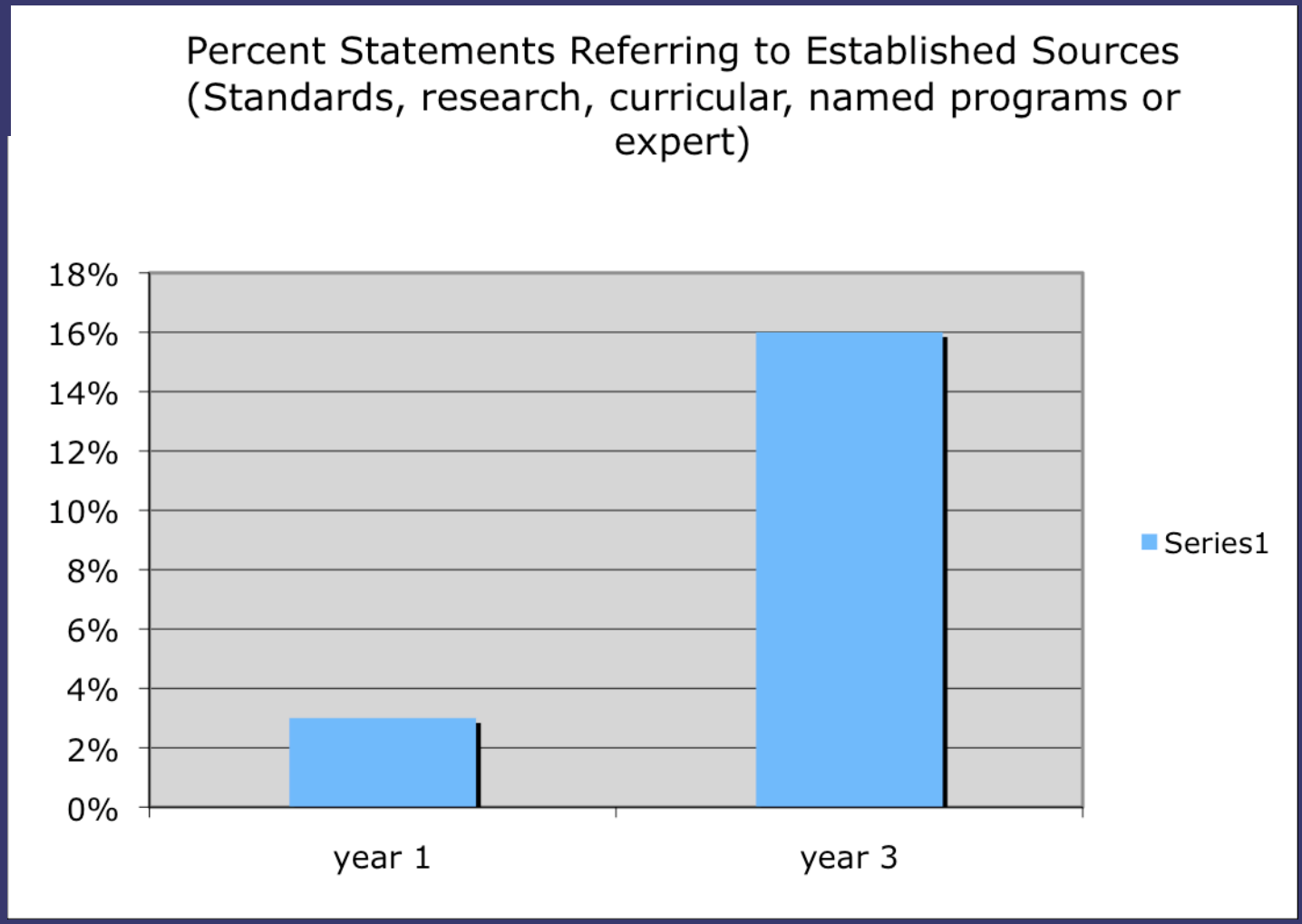
Solution

$\frac{3}{m} = \frac{5}{15}$	Write original proportion.
$3 \cdot 15 = m \cdot 5$	Cross products property
$\frac{3 \cdot 15}{5} = \frac{m \cdot 5}{5}$	Divide each side by 5.
$9 = m$	Simplify. m is by itself.

ANSWER The solution is 9.

CHECK ✓ You can check the solution by showing that $\frac{3}{9}$ and $\frac{5}{15}$ simplify to the same fraction:

$$\frac{3}{9} = \frac{1}{3} \text{ and } \frac{5}{15} = \frac{1}{3}, \text{ so } \frac{3}{9} = \frac{5}{15}.$$


Percent Statements Referring to Established Sources (Standards, research, curricular, named programs or expert)
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
year 1
year 3
Series1

Impact of Lesson Study on Teachers' Skills, Dispositions, Beliefs

Examples:

Skills

- Running an efficient, productive meeting

Dispositions

- Curiosity about student thinking

Beliefs

- Students learn through struggling

Impact of Lesson Study on Skills, Dispositions, Beliefs

Your examples…..

What advice do you have about designing lesson study to build productive dispositions, beliefs, skills on the part of teachers?

Improving the Impact of Lesson Study on Teachers' Dispositions, Beliefs, Skills

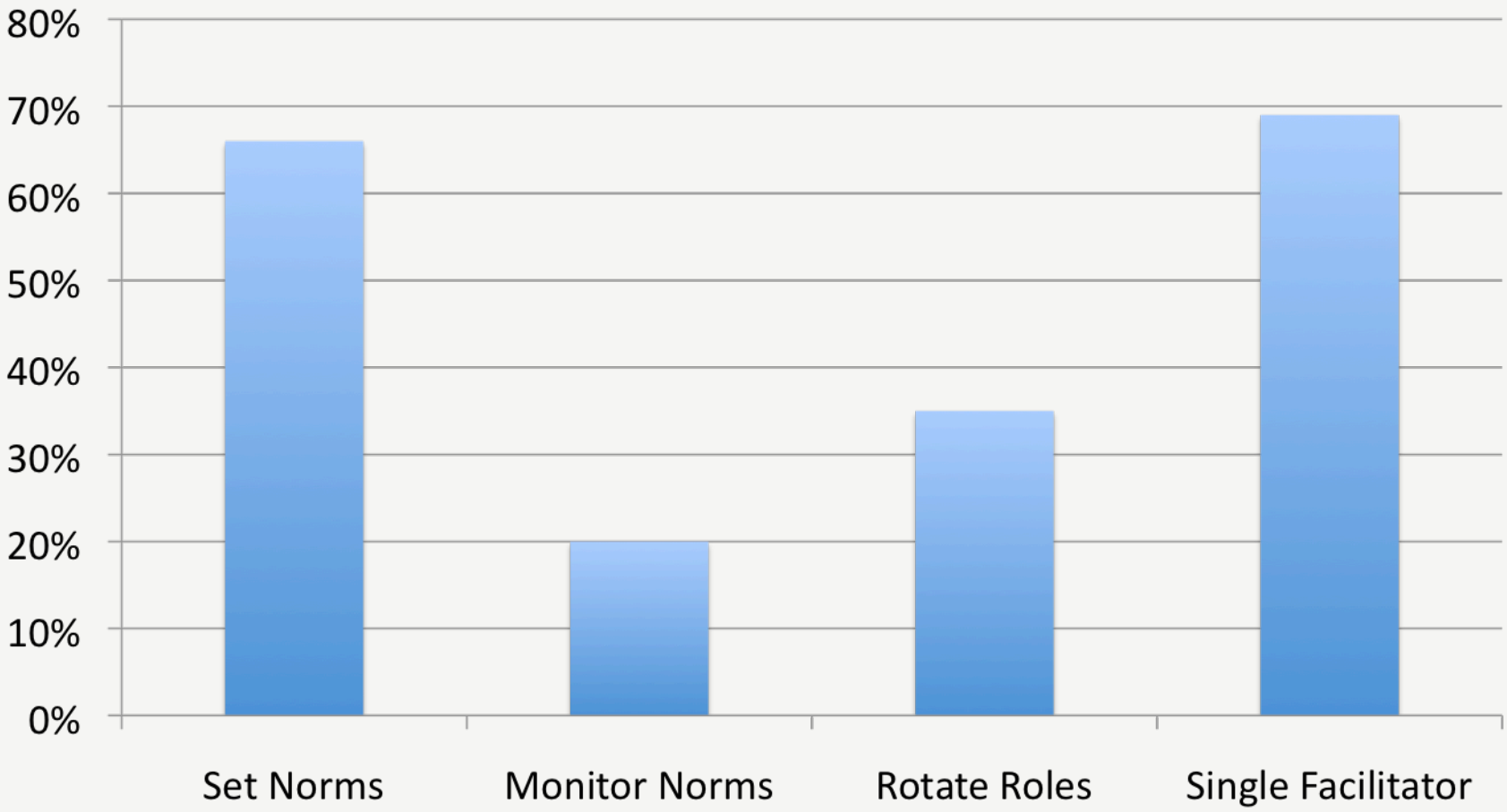
- Establish and revisit norms
- Rotate roles so all members become leaders (recorder, facilitator, materials researcher, etc.)
- Use disagreements as learning opportunities
- Be deliberate about your learning: take time to consolidate, write up, and carry forward learning

Impact of Lesson Study on Teachers' Beliefs, Dispositions, Skills…

(Re)discover the fun of studying student learning

- Investigate something that truly interests group members
- Have each teacher pose an inquiry question
- Capture student learning in several ways
- Move outside your comfort zone and try something new

2008 California Conference Attendees



Noticing How Student Gestures Reveal Their Thinking About Fractions

Question Shifts From 1/3 to 1/4

Experiences that build efficacy

From “How Many Seats?” Heather:

Before the lesson:

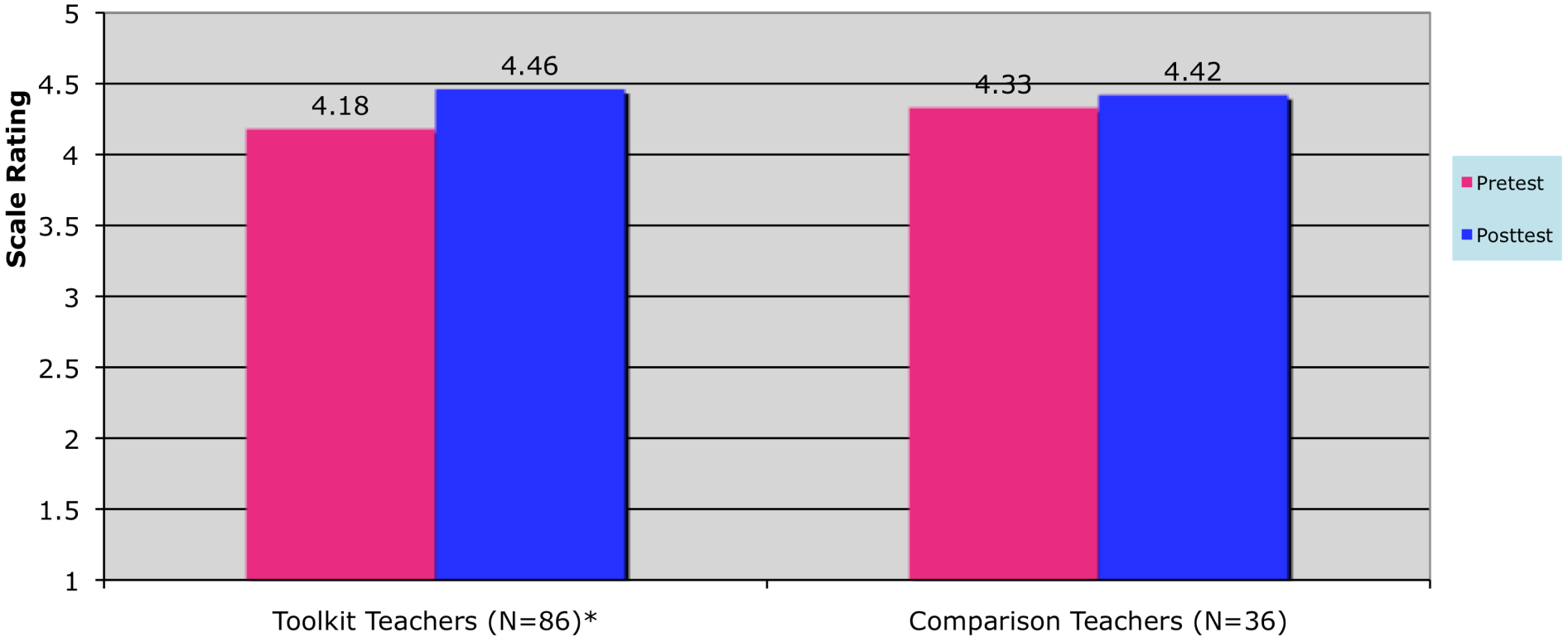
“I think just throwing random numbers up on the board and letting the kids try to figure out stuff, I am just like oh good gosh I don‘t want to do it….”

Experiences that build efficacy

After the lesson:

"This lesson got to the core of what we wanted to do…get the kids to *understand* the pattern, as opposed to plug in a number and get an answer in which we've spoonfed it to them... It was hard for us initially. We really wanted that worksheet! But to get rid of it was really liberating…"

By Trying a Different Teaching Method, I Can Significantly Affect a Student's Achievement.



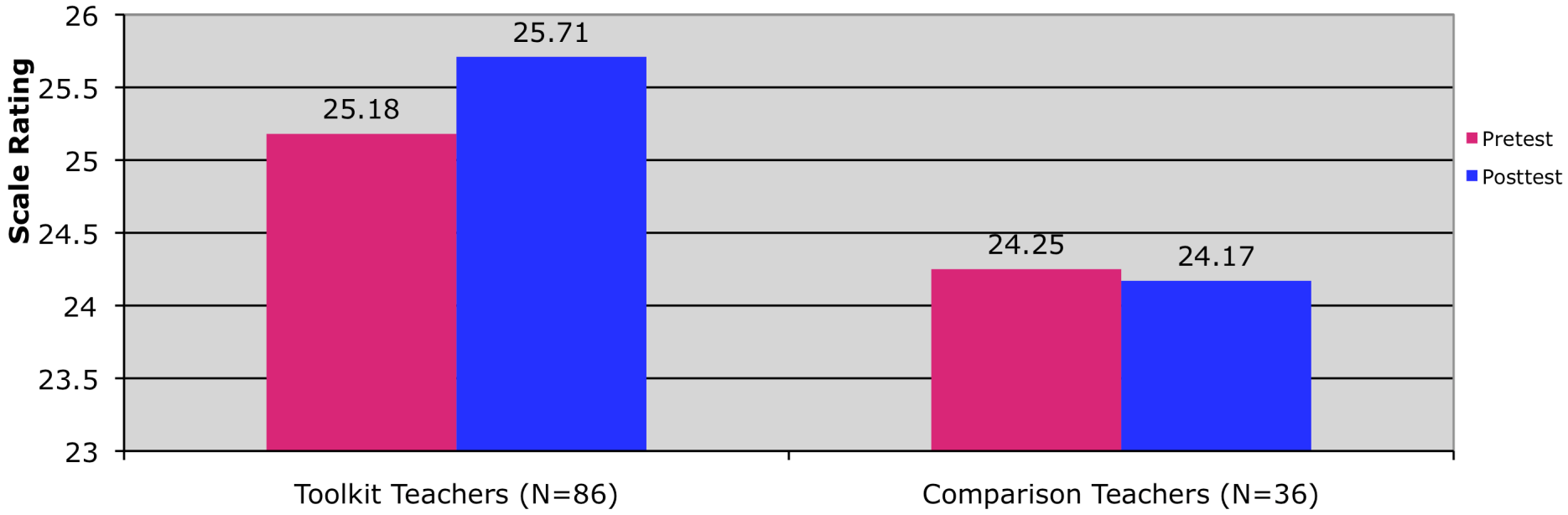
Experiences that Shape Identity

... As a Kindergarten teacher, I was always very focused on the standards…the Kindergarten state standards....And I always thought "I like teaching Kindergarten because…I know enough. I don't need to learn any math. I know enough because I teach five year olds." And I just realized when I saw that first grade example [a lesson planned by Japanese teachers] they weren't thinking first grade math in their heads. They knew the standards all the way up....I feel like I've been teaching with such a narrow perspective. …I really didn't understand why we kept spending an hour or two on geometry…I'm not going to teach in Kindergarten. And then I realized, I need to know the whole picture…I always thought "I know enough." ....I feel ashamed that that is the way I've been thinking.

Teachers' Interest/ Enjoyment in Learning Mathematics

- I enjoy teaching mathematics.
- I like solving mathematics problems.
- I actively look for opportunities to learn more mathematics.
- I would like to learn more about area of polygons.
- I am interested in the mathematics taught at many grade levels.
- I would like to learn more about ratio, proportion, and rate..

Teachers' Interest/ Enjoyment in Learning Mathematics



How Does Lesson Study Impact the Professional Community?

Changes in daily "talk around the water cooler"

- Sharing of knowledge from practice
- Willingness to say what is *not* working

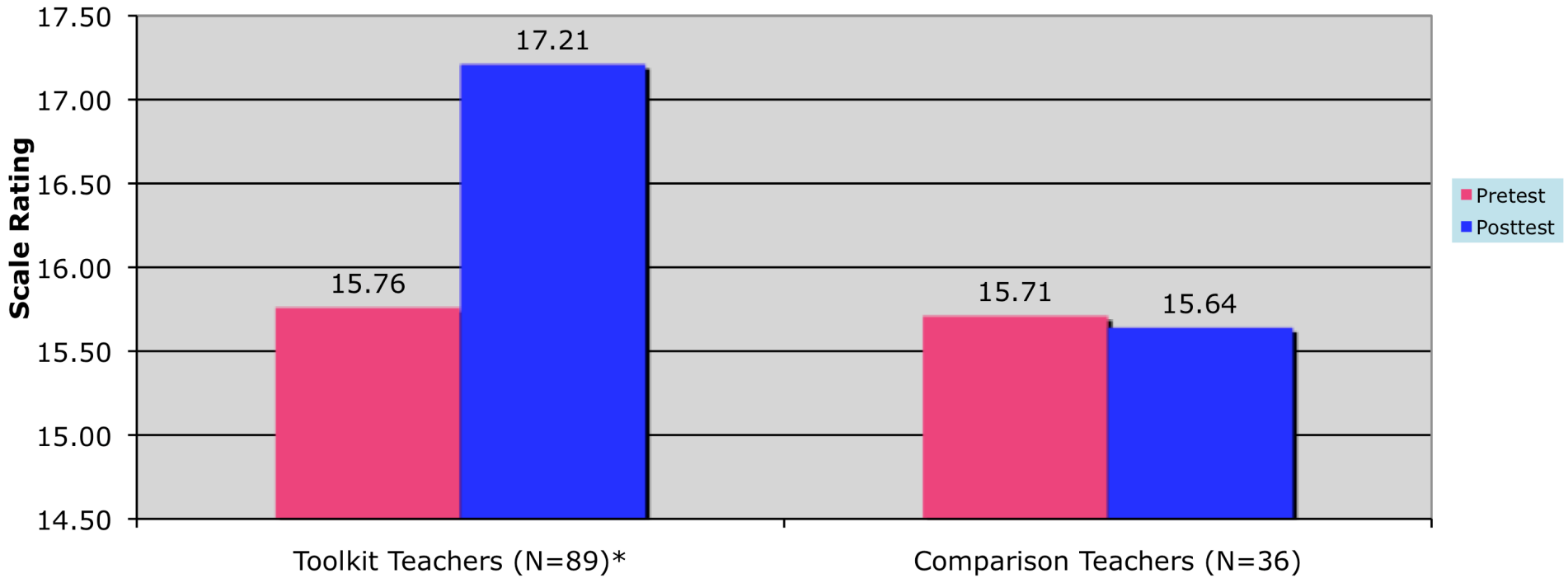
"Our" students, not "your" or "my" students, and commitment to improvement of *each other's* practice

Well-developed structures, skills, and will to have hard conversations

Teachers' Collegial Learning Effectiveness

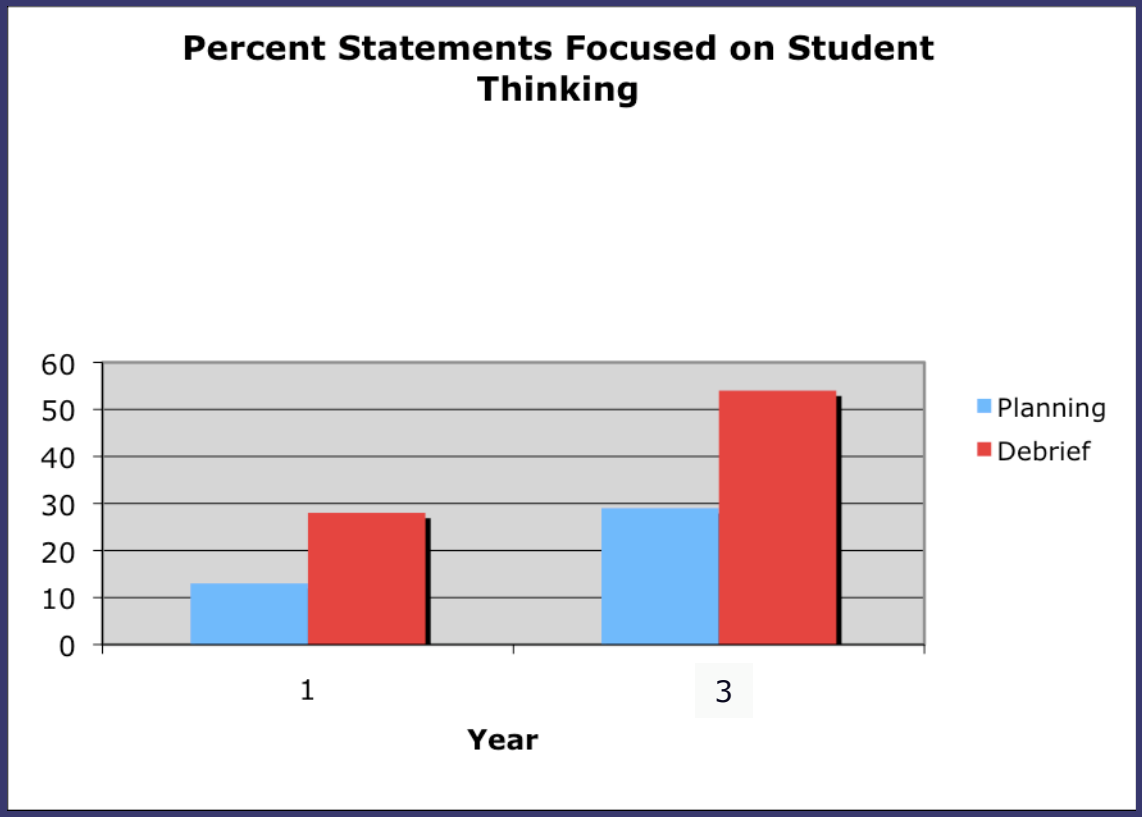
- I have learned a lot about student thinking by working with colleagues.
- I have learned a great deal about mathematics teaching from colleagues.
- I find it useful to solve mathematics problems with colleagues.
- Working with colleagues on mathematical tasks is often unpleasant (reversed)

Teachers' Collegial Learning Effectiveness

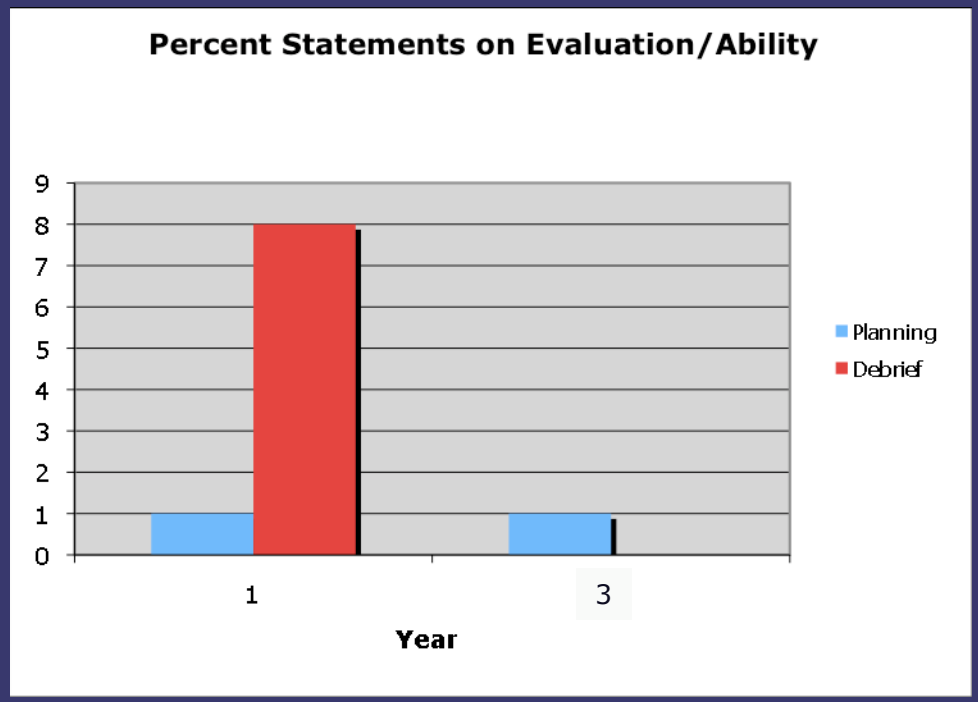


How Can We Maximize the Impact of Lesson Study on Professional Community?

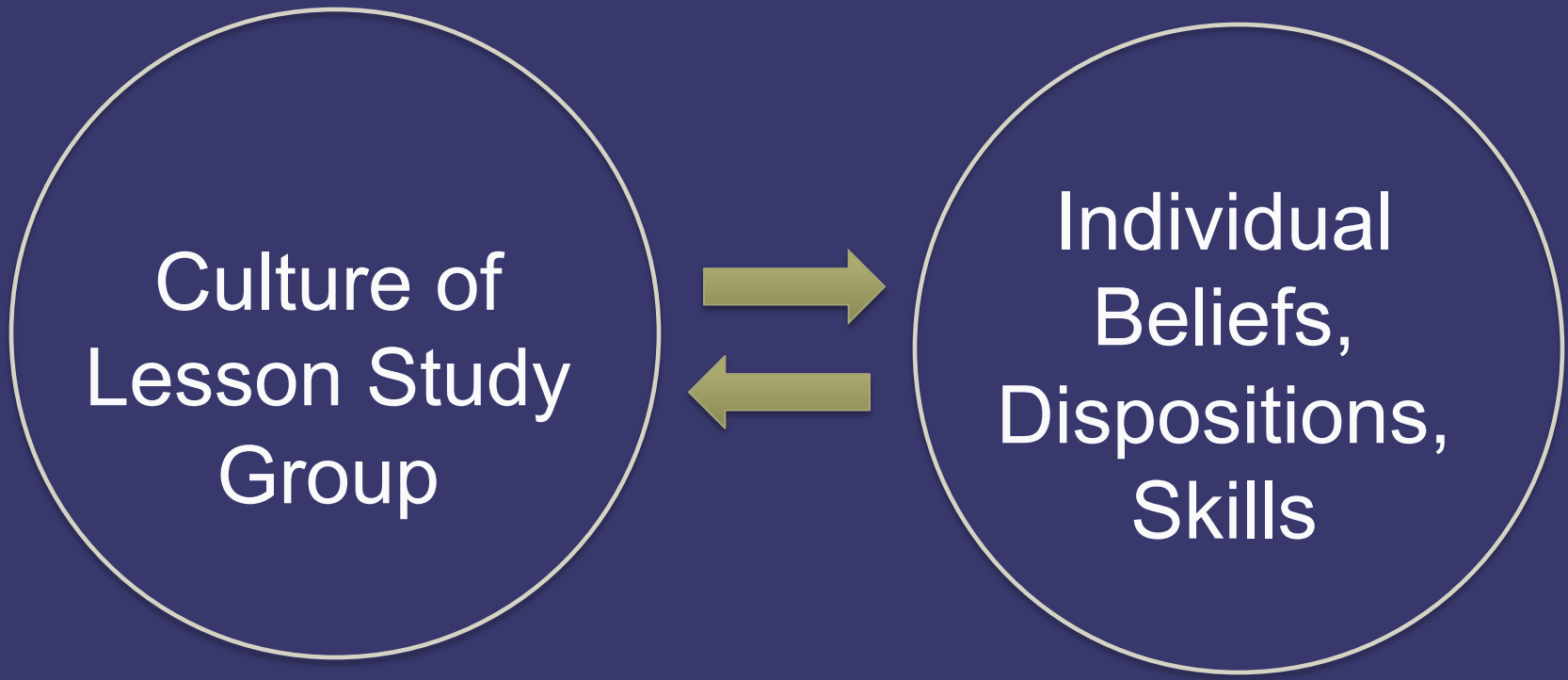
Make your lesson study group a microcosm of the ideal school culture you want to live in, for example…



Schoolwide Lesson Study School


Percent Statements on Evaluation/Ability
9
8
7
6
5
4
3
2
1
0
1
3
Year
Planning
Debrief

The Lesson Study Group Culture Nurtures Individual Teachers



How Does Lesson Study Improve Lesson Materials and Tasks?

- Example from “How Many Seats?” that lesson without t-chart better promotes student learning…such changes should be reflected in textbooks!

- Protocols for capturing student thinking, holding a productive post-lesson discussion, etc.

How Does Lesson Study Improve Instruction?

Visible Features of Lesson Study

- Planning
- Curriculum Study
- Research Lesson
- Data Collection
- Discussion
- Revision
- Etc.

→

Pathways

Teachers' Knowledge
- -of Content
- -of Instruction
- -of Student Thinking
- -of Curriculum

Teachers' Beliefs, Dispositions
- -Attention to Student Thinking
- -Beliefs about Students
- -Inquiry Stance toward Practice
- -Identity
- -Sense of Efficacy

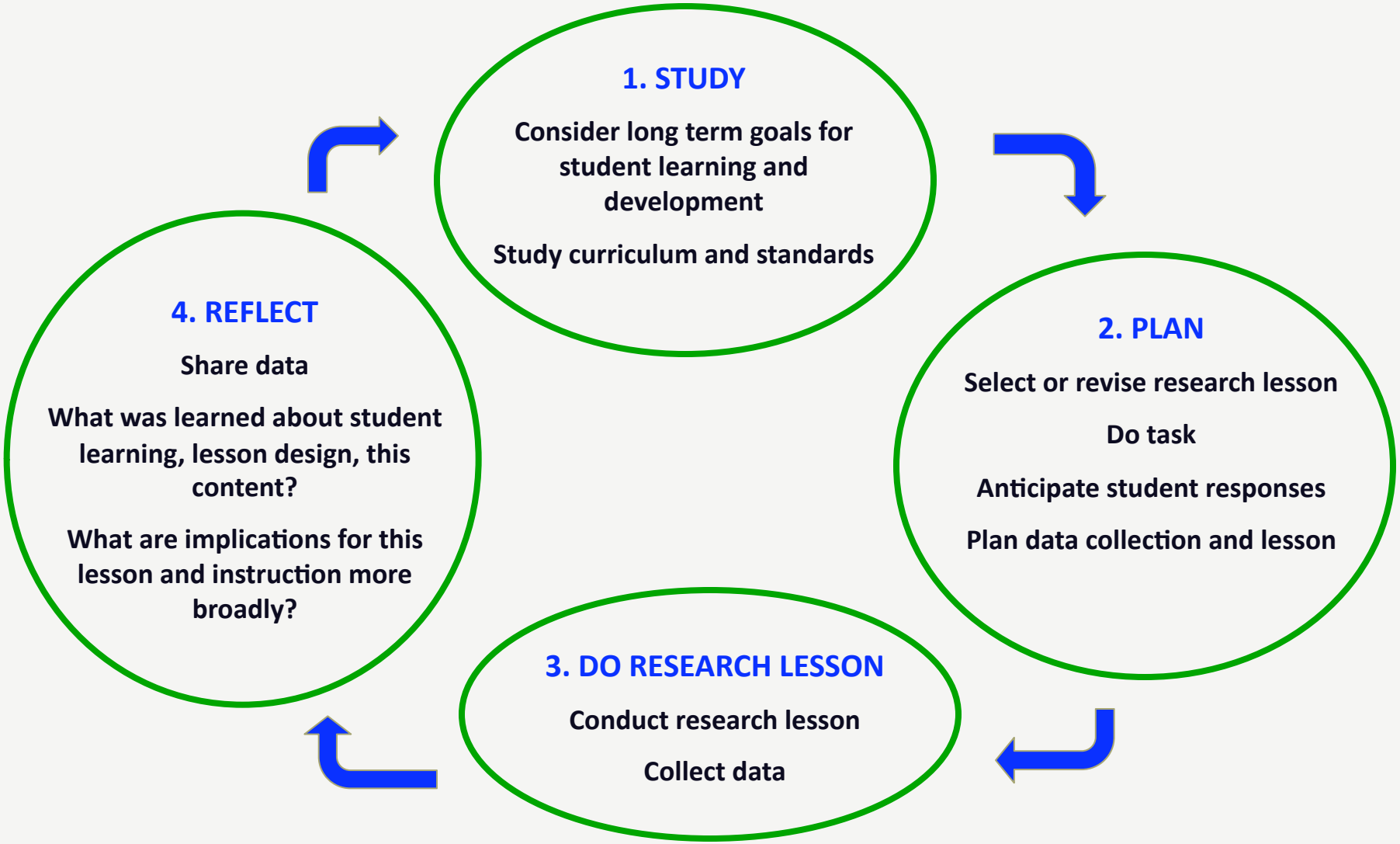
Professional Community
- -Changes in Norms
- -Changes in Relationships
- -Changes in Learning Opportunities

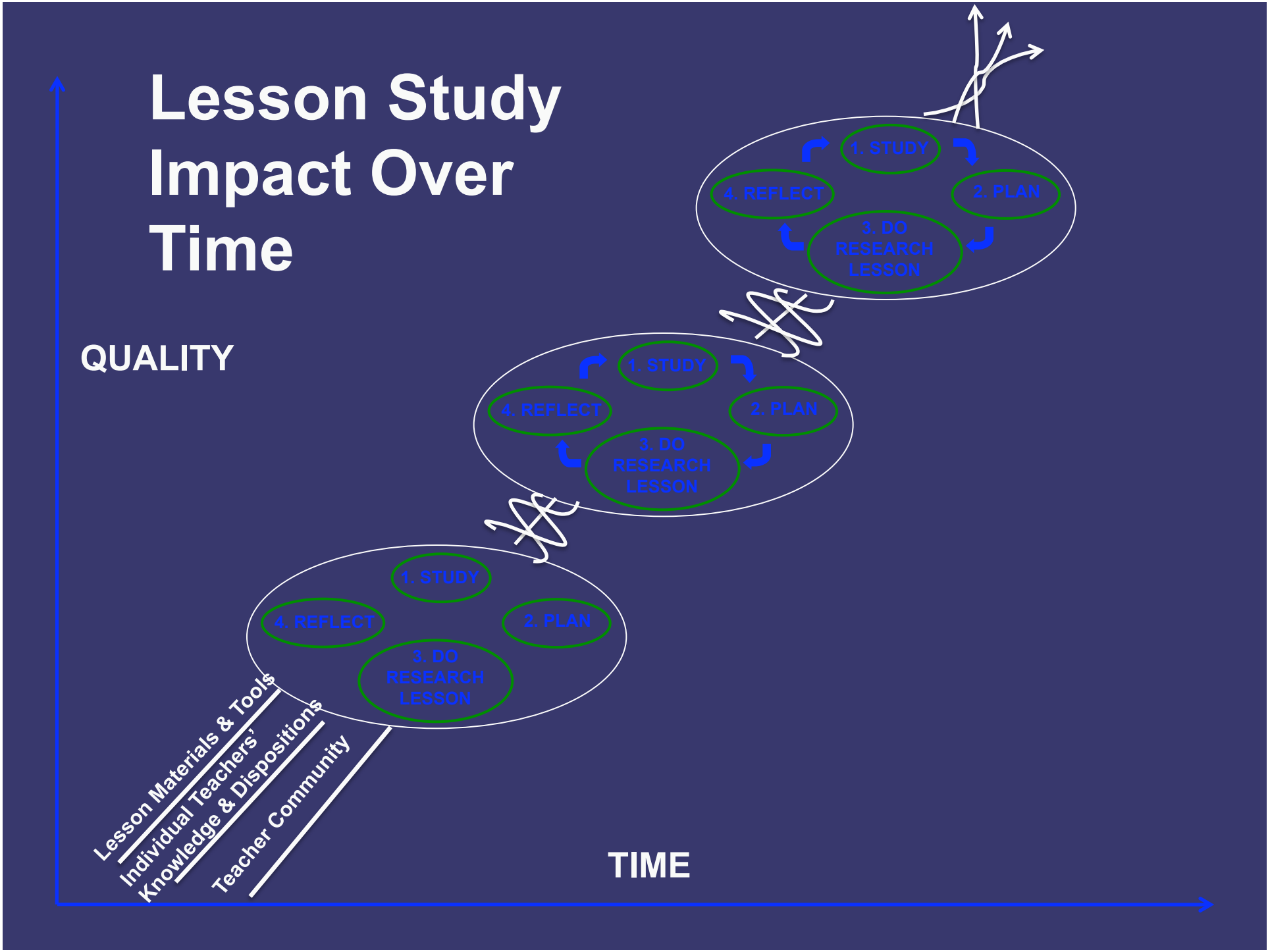
Materials & Tools
- -Tasks, lessons, etc.

→

Instructional Improvement

Lesson Study

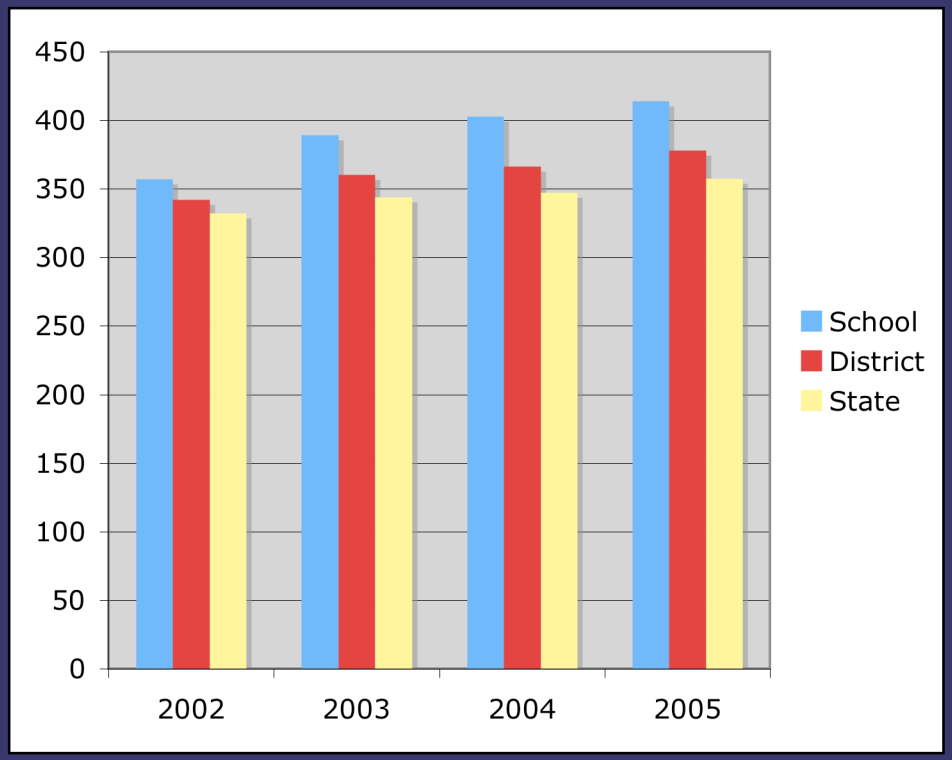



Lesson Study Impact Over Time
QUALITY
TIME
1. STUDY
2. PLAN
3. DO RESEARCH LESSON
4. REFLECT
1. STUDY
2. PLAN
3. DO RESEARCH LESSON
4. REFLECT
1. STUDY
2. PLAN
3. DO RESEARCH LESSON
4. REFLECT
Lesson Materials & Tools
Individual Teachers' Knowledge & Dispositions
Teacher Community

Today

We know that lesson study can:

- Persist for a decade (in many sites)
- Be led and improved by US teachers
- Improve student achievement
- Build collaborative culture in US schools
- Build teachers' knowledge



California Standards Test in Mathematics: Mean Scale Scores, Grades 2-5

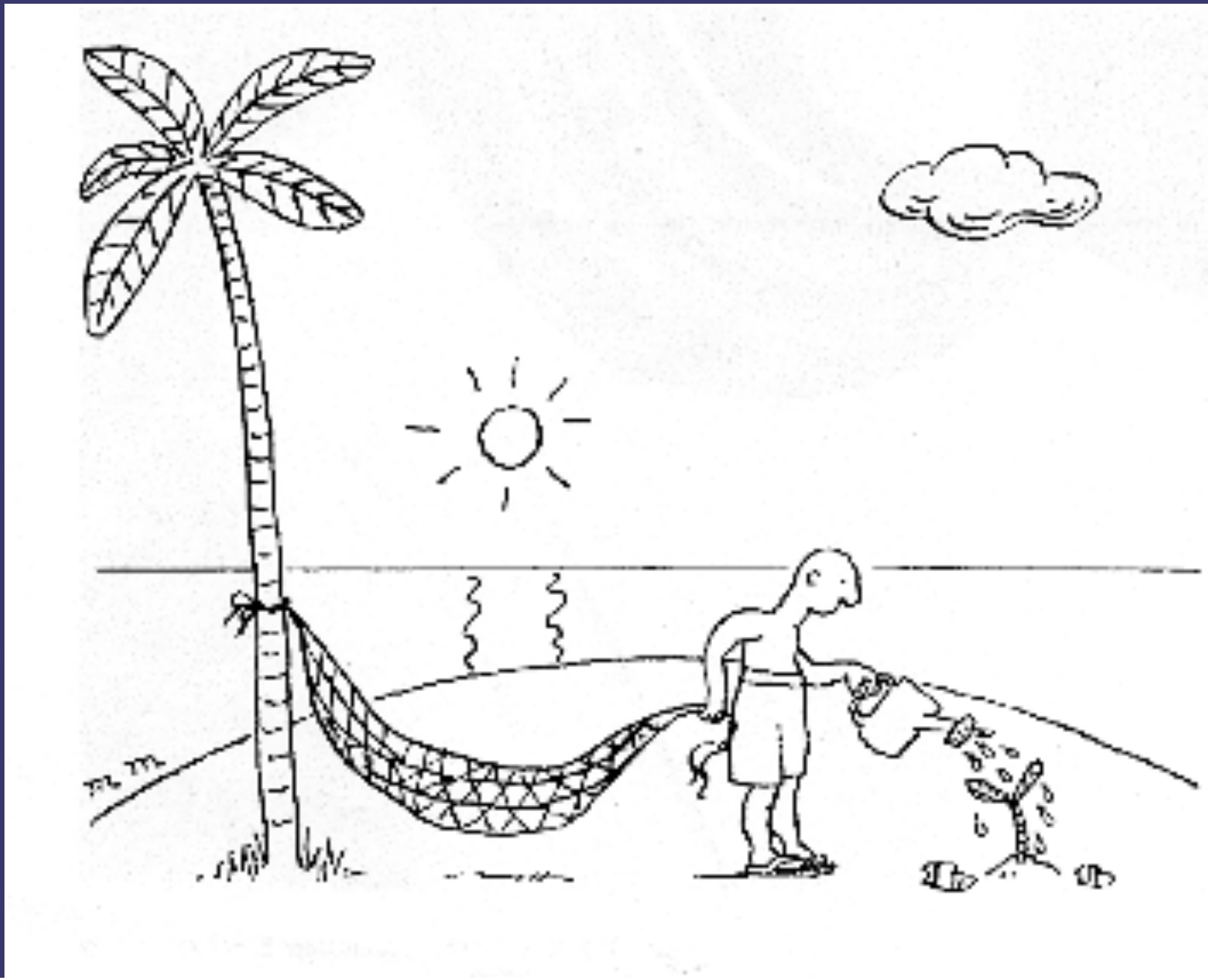
3-year net increase for school more than triple that for district (F=.309, 845df p<.001) **Lewis, Perry, Hurd & O'Connell, *Phi Delta Kappan* 88:4, 2006**

Next Steps…

- Make the pathways of lesson study impact more visible -- how lesson study shapes individual teachers, teacher community, and teaching materials-tools
- Share our work nationally—live and on line–process and results
- Shape textbooks through lesson study

Next Steps…

- Share good materials for lesson study kyouzai kenkyuu
- Use lesson study to guide and study policy changes



Further Information

Lesson Study: A Handbook...(Lewis) www.rbs.org

Building Our Understanding of Lesson Study (Wang-Iverson & Yoshida www.rbs.org

Mills College Lesson Study Group www.lessonresearch.net

Chicago Lesson Study Group www.lessonstudygroup.net/

APEC http://hrd.apec.org/index.php/Lesson_Study

Global Education Resources www.globaledresources.com

Oakland USD History Lesson Study http://www.teachingamericanhistory.us/lesson_study/

Lesson Study Communities Project in Secondary Mathematics www2.edc.org/lessonstudy/

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