Systems Thinking to Improve Student Outcomes: Introduction to Improvement Science

NYCOSS Thought Leadership Summit
Fairport, New York
March 22-23, 2018

v6

Agenda Outline

- Introductions (10 minutes)
- Improvement Science Overview (20 minutes)
- Small Group Discussions (25 minutes)
- Large Group Share-out (15 minutes)
- Take-aways & Resources (10 minutes)
- Q & A (10 minutes)

WestEd overview

- Making a quality difference in the lives of children, youth, and adults.
- WestEd is a research, development, and service agency that works with education and other communities to promote excellence, achieve equity, and improve learning for children, youth, and adults.

Introductions

Facilitator

Terry Hofer, Ed.D.

Director, New York School & District Services

Presenters

Tran Keys, Ph.D.

Senior Researcher

Joe Sassone

Development Director, School & District Services

Show of fingers – How familiar are you with Improvement Science?

1- **Brand new**

2- **Familiar** with key concepts and tools

3- **Experience *applying*** concepts and tools

4- **Experience *leading*** and/or coaching others

5- "I am an Improvement Science **expert**!"

Learning Objectives

Participants will understand…

1. Three key ideas behind an organizational learning approach to improvement
2. Components of a learning system
3. Improvement Science = Continuous Improvement

Flying

On average, how many FAA monitored flights happened each day in 2016?

1) 0 – 10,000
2) 10,000 – 20,000
3) 20,001 – 30,000
4) 30,001 – 40,000
5) More than 40,000

Flying

On average, how many FAA monitored flights happened each day in 2016?

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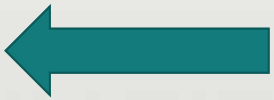
3) 20,001 – 30,000
4) 30,001 – 40,000
5) **More than 40,000**



42,700 average daily flights handled by the FAA in 2016.

Flying, cont'd

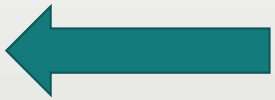
In 2016, how many people flew on FAA monitored flights (Millions)

1) 0 – 250 M
2) 250 – 500 M
3) 500 – 750 M
4) 750 – 1,000 M
5) More than a billion passengers

Flying, cont'd

In 2017, how many people flew on FAA monitored flights (Millions)

1) 0 – 250 M
2) 250 – 500 M
3) 500 – 750 M
4) **750 – 1,000 M**
5) More than a billion passengers



In 2017, about 841 million people flew on commercial airlines in the United States.

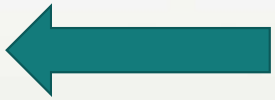
Flying, cont'd

How many people died in commercial plane crashes last year in the United States?

1) 0
2) 1-10
3) 11-100
4) More than 100

Flying, cont'd

How many people died in commercial plane crashes last year in the United States?

1) **0** 
2) 1-10
3) 11-100
4) More than 100

Why is flying so safe?

Thoughts?

Why is flying so safe?

RESEARCH ACCOUNTABILITY LEARNING

Why is flying so safe?

RESEARCH **ACCOUNTABILITY** LEARNING

Why is flying so safe?

RESEARCH ACCOUNTABILITY

LEARNING

Why is flying so safe?

RESEARCH

ACCOUNTABILITY

LEARNING

Reading

Approximately how many fourth graders are there in the United States?

1) 0 – 1,500,000
2) 1,500,001 – 3,000,000
3) 3,000,001 – 4,500,000
4) 4,500,001 – 6,000,000
5) More than 6,000,000

Reading

Approximately how many fourth graders are there in the United States?

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2) 1,500,001 – 3,000,000
3) **3,000,001 – 4,500,000**
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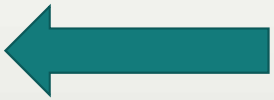

~3,840,000 fourth graders

Reading, cont'd

In 2017, according to standardized assessments, how many can read at or above grade level?

1) 0 – 20 percent
2) 21 – 40 percent
3) 41 – 60 percent
4) 61 – 80 percent
5) 81 – 100 percent

Reading, cont'd

In 2017, according to standardized assessments, how many can read at or above grade level?

1) 0 – 20 percent
2) **21 – 40 percent**  **~35%**
3) 41 – 60 percent
4) 61 – 80 percent
5) 81 – 100 percent

Reading – Why only 35%?

RESEARCH

ACCOUNTABILITY

LEARNING

Reading – Why only 35%?

RESEARCH

ACCOUNTABILITY

LEARNING

Three Ways Data Support Improvement

	Primary Audience	Purpose	Measurement Criteria
Research	• Scientific community • Policymakers • Decision makers	• New knowledge, irrespective of applicability	• Many • Complex collection
Accountability	• Parents • Students • Taxpayers	• Basis for choice • Reassurance • Spur for change	• Very few • Complex collection
Organizational Learning	• Teachers • Principals • District Leaders • Managers	• Understanding of process or student learning • Motivation and focus • Baseline • Evaluation of changes	• Few • Easy to collect • Frequent

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How does organizational learning lead to improvement?

Three key ideas…

(Adapted from Berwick, 1996)

All improvement begins with dissatisfaction with the status quo.

Every system is perfectly designed to get the results it gets.

All improvement requires change, but not every change is an improvement.

How does organizational learning lead to improvement?

1. All improvement begins with dissatisfaction with the status quo.
2. Every system is perfectly designed to get the results it gets.
3. All improvement requires change, but not every change is an improvement.

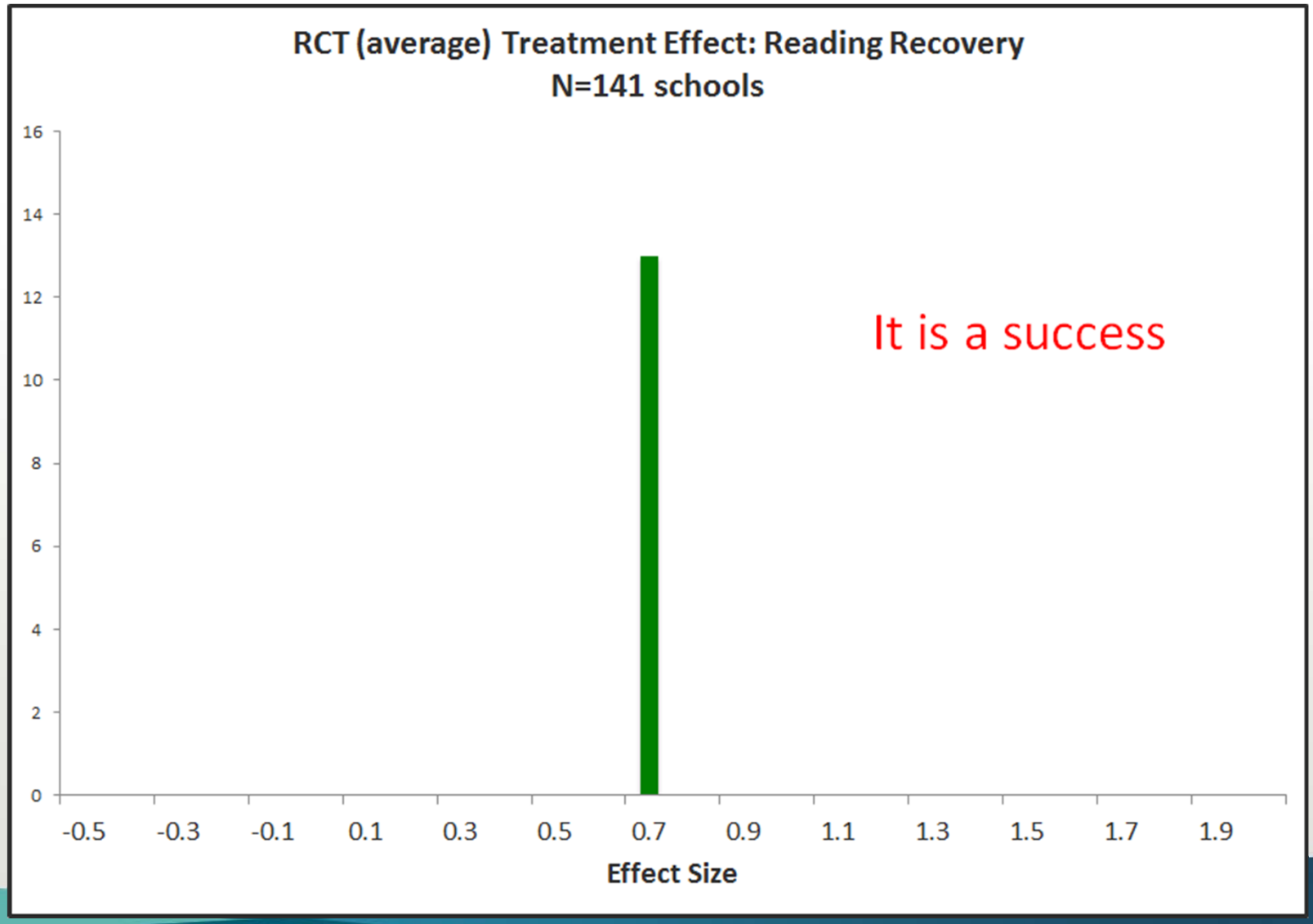
Example: Reading Recovery

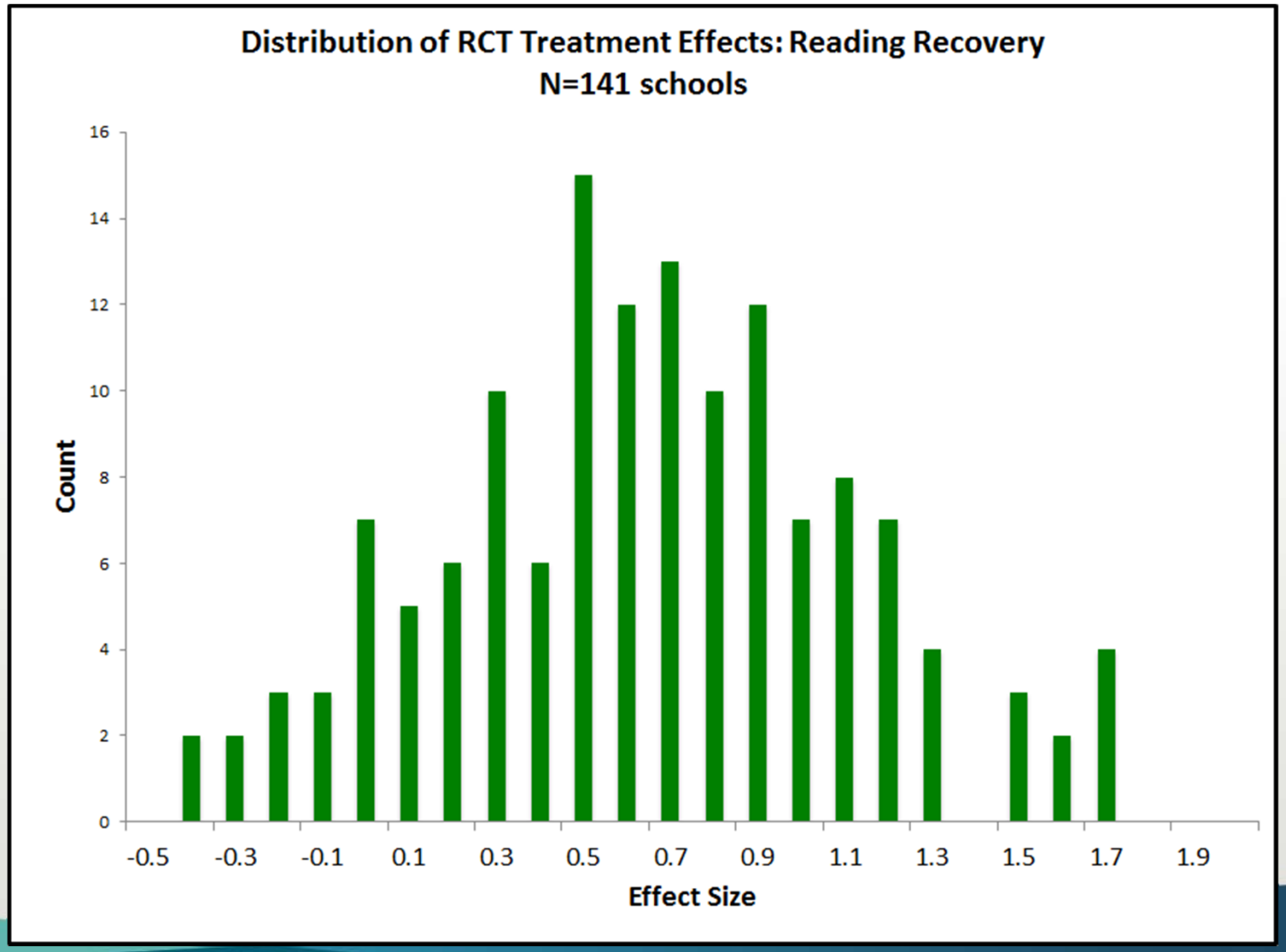
Evidence-based intervention

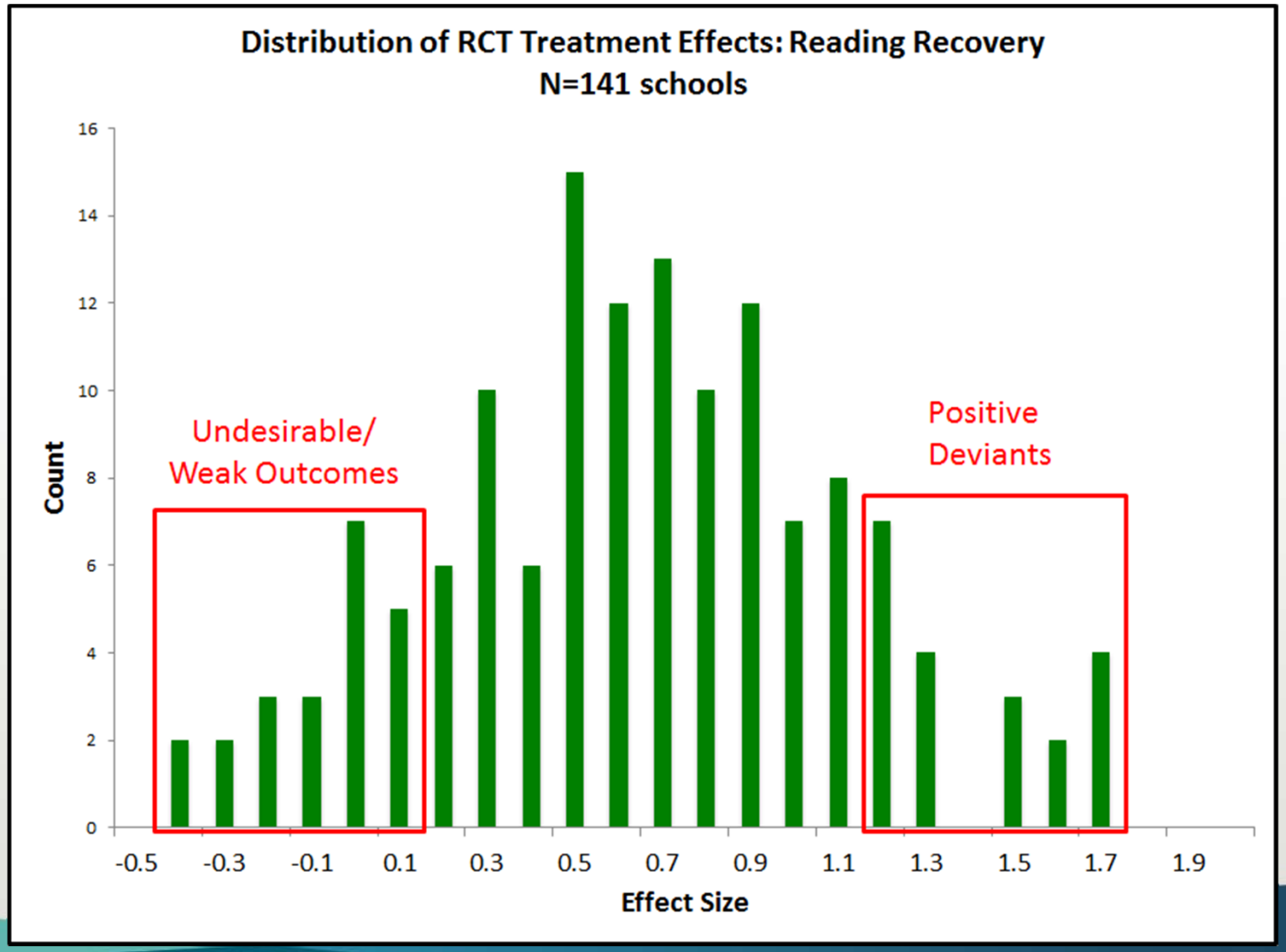
Huge experiment (141 schools)

Results after year one of a randomized field trial (i3)

Example adapted from the Carnegie Foundation for the Advancement of Teaching


RCT (average) Treatment Effect: Reading Recovery
N=141 schools
16
14
12
10
8
6
4
2
0
-0.5
-0.3
-0.1
0.1
0.3
0.5
0.7
0.9
1.1
1.3
1.5
1.7
1.9
Effect Size
It is a success


Distribution of RCT Treatment Effects: Reading Recovery
N=141 schools
Count
16
14
12
10
8
6
4
2
0
-0.5
-0.3
-0.1
0.1
0.3
0.5
0.7
0.9
1.1
1.3
1.5
1.7
1.9
Effect Size

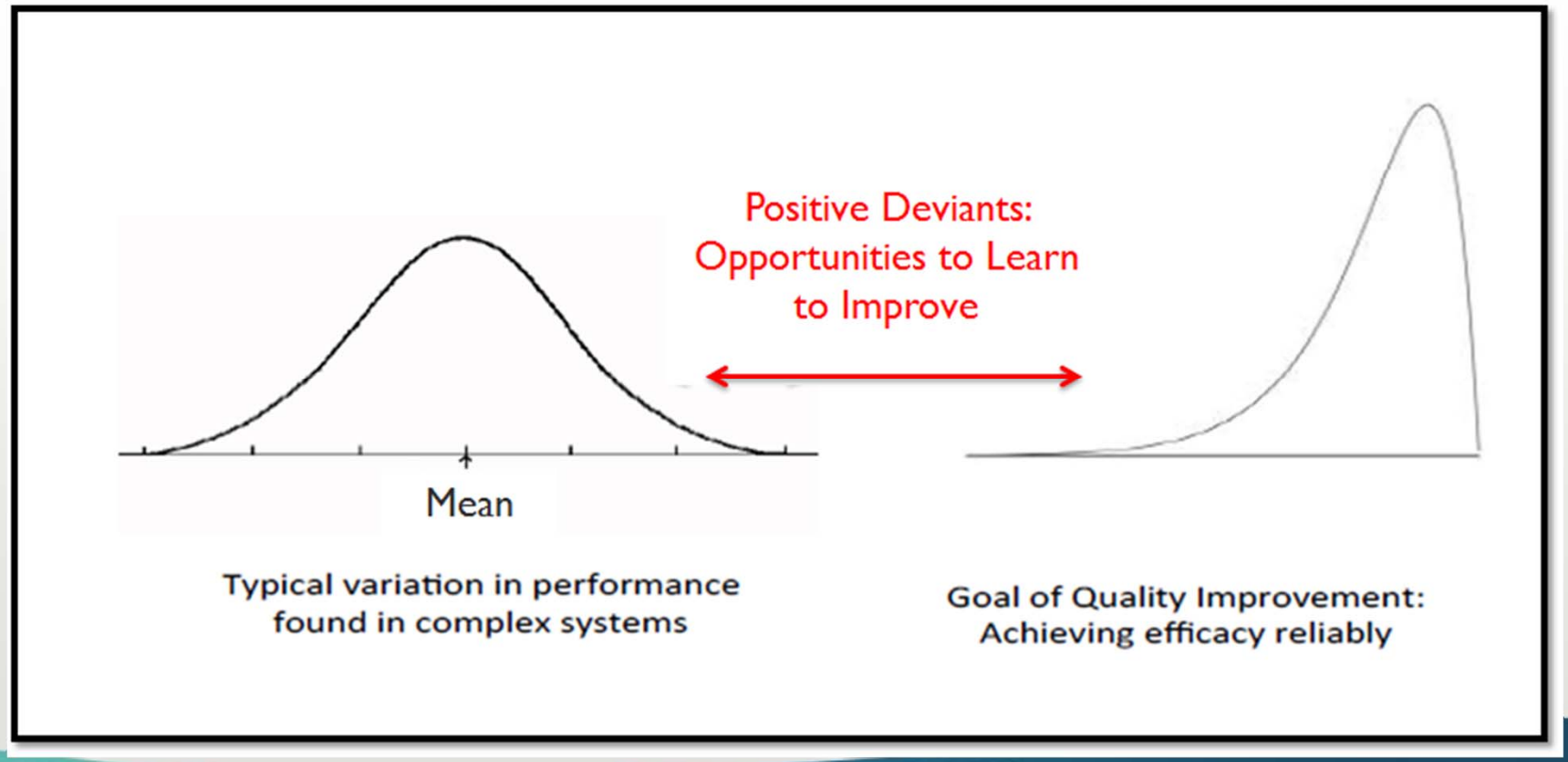

Distribution of RCT Treatment Effects: Reading Recovery
N=141 schools
Count
16
14
12
10
8
6
4
2
0
Undesirable/
Weak Outcomes
Positive
Deviants
-0.5
-0.3
-0.1
0.1
0.3
0.5
0.7
0.9
1.1
1.3
1.5
1.7
1.9
Effect Size

How does organizational learning lead to improvement?

To achieve an ambitious improvement goal, you need robust mechanisms for learning that influence the *processes*, *structures*, and *norms* of the organization.

Goal of Improvement:

Replicate Positive Results over Diverse Contexts



The Model for Improvement

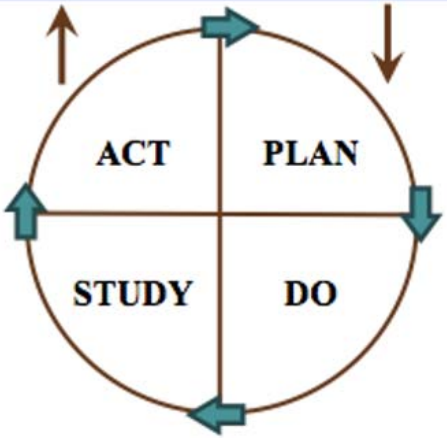
Making your aim and theory explicit

What specifically are we trying to accomplish?

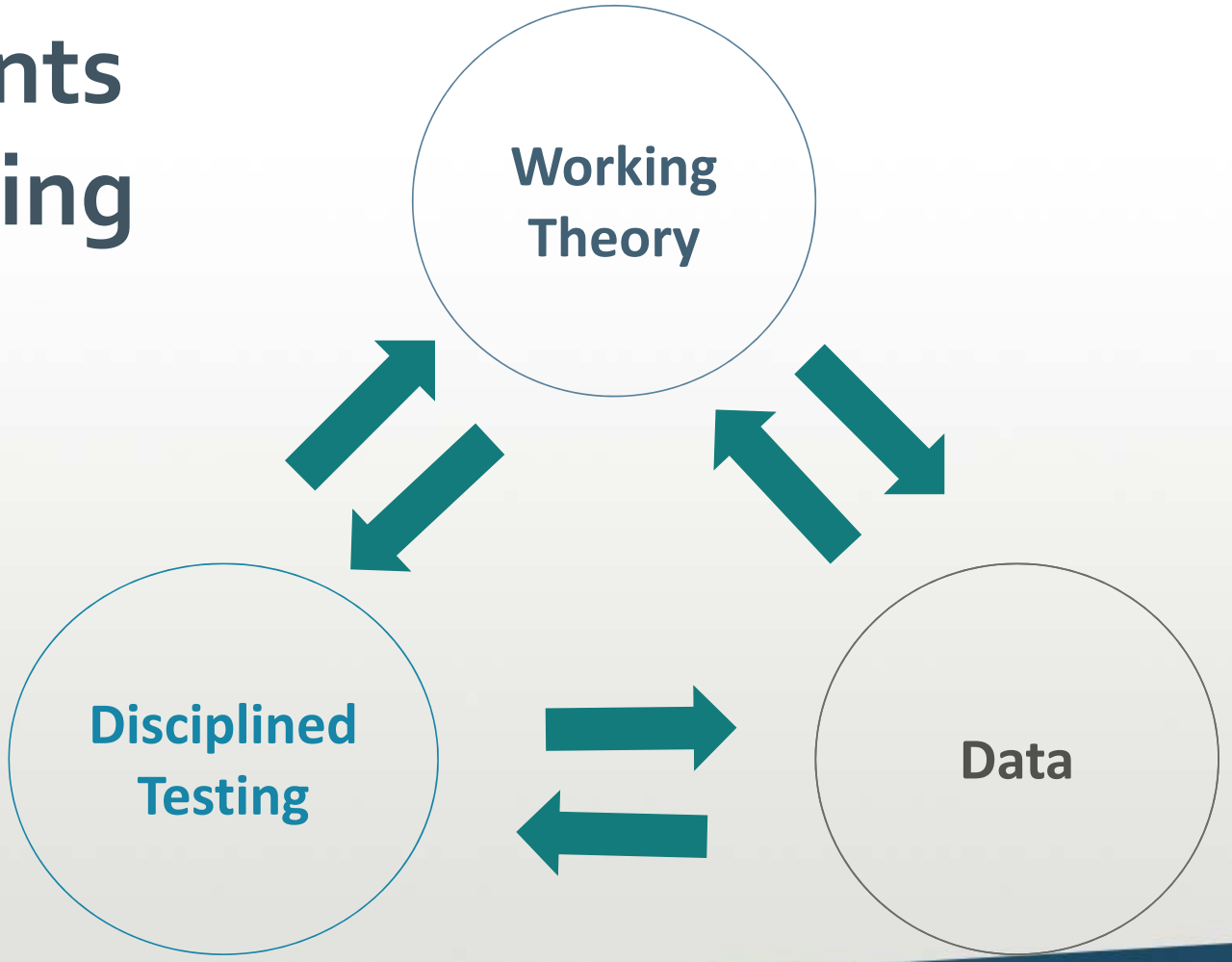
What change(s) might we make and why?

How will we know that a change is an improvement?

Learning through testing



Components of a Learning System



Small group discussions (25 minutes)

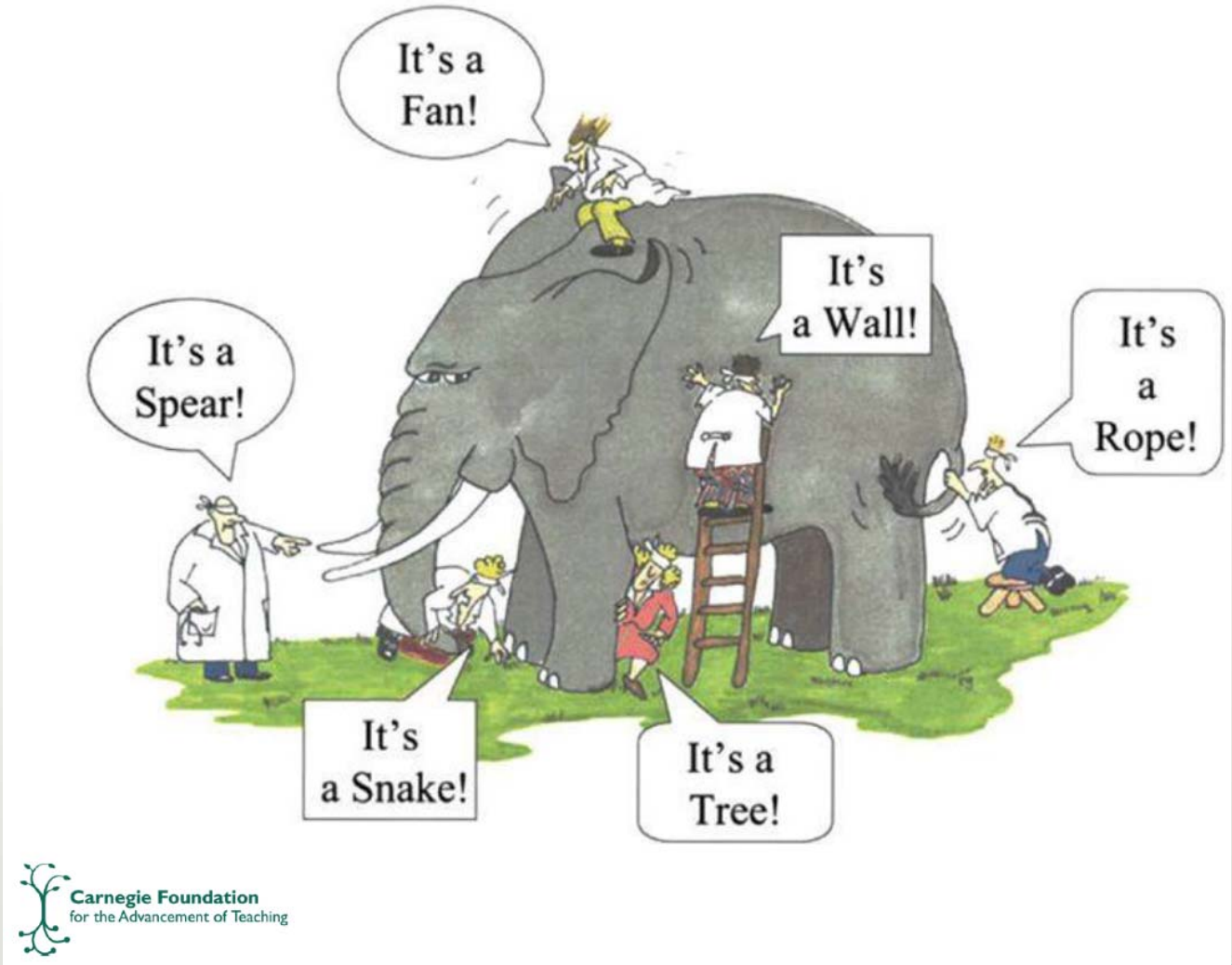
Outline a **problem of practice** in your district that could benefit from applying an Improvement Science methodology?

Review: How does learning lead to improvement?

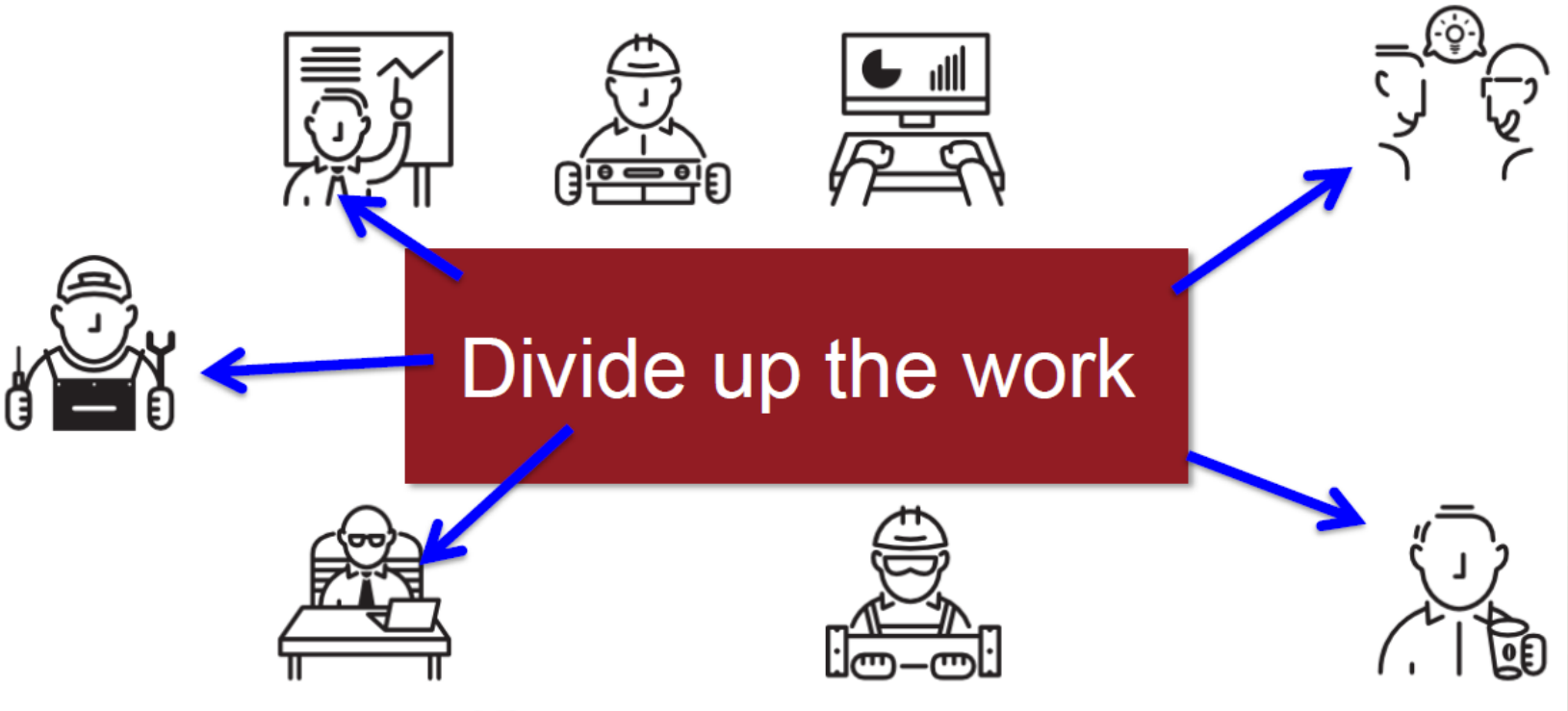
1. All improvement begins with dissatisfaction with the status quo.
2. Every system is perfectly designed to get the results it gets.
3. All improvement requires change, but not every change is an improvement.

Large Group Share-out (15 minutes)

Take-aways


It's a Fan!
It's a Spear!
It's a Wall!
It's a Rope!
It's a Snake!
It's a Tree!
Carnegie Foundation
for the Advancement of Teaching

Investigating a Problem as a Team



Learning as a Team

Improvement Science

Social learning

Systems-focused

Non-Linear

Disciplined

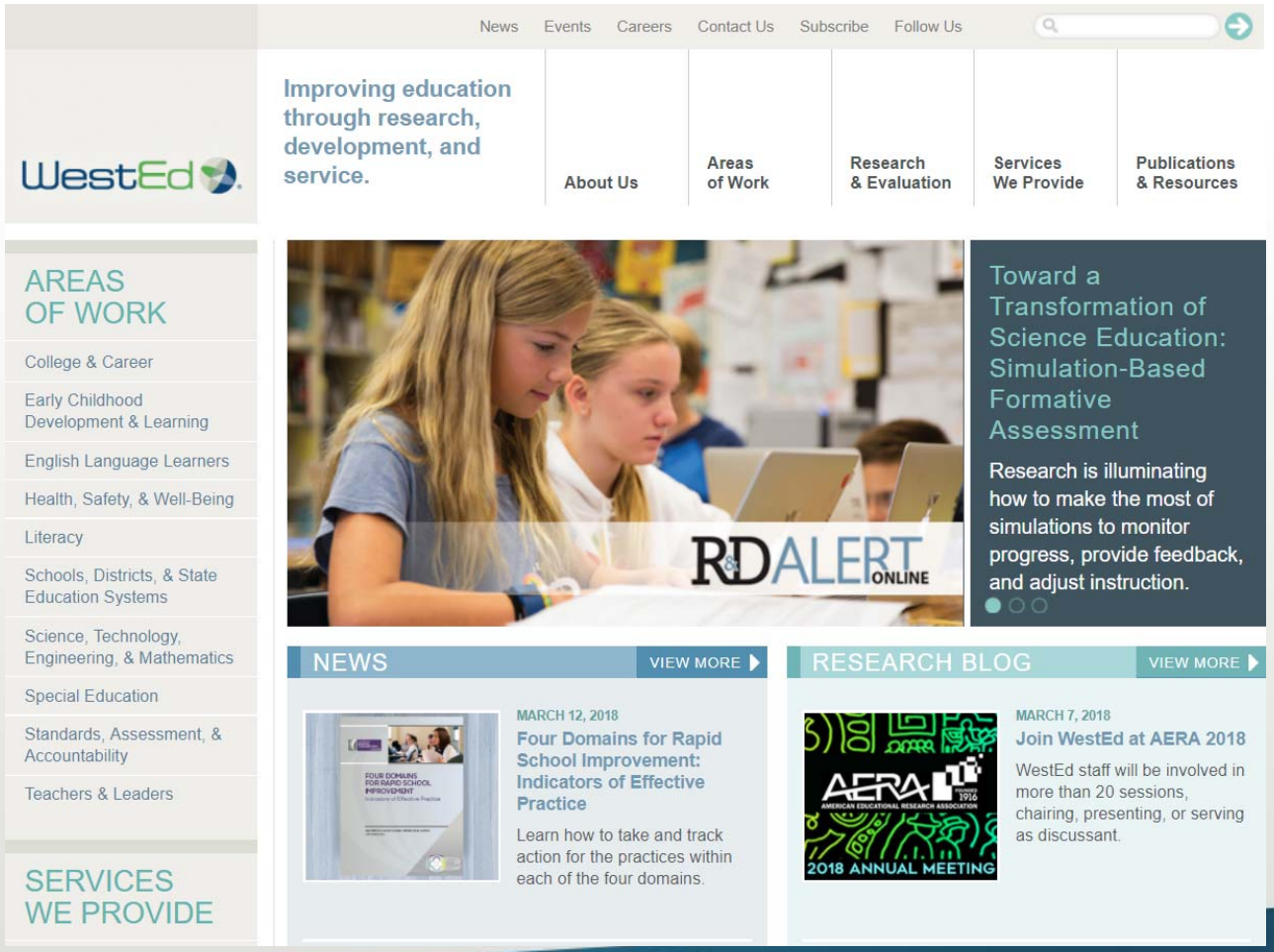
Carnegie Foundation for the Advancement of Teaching

Improvement Science = Continuous Improvement

- Improvement Science supports the education field to "get better at getting better"
- Continuous improvement entails ongoing cycles of analysis and adjustment of practice involving all stakeholders
- Data-based analysis and decision making is the foundation of continuous improvement

Resources

WestEd main page



Resources, cont'd

- **Carnegie Foundation for the Advancement of Teaching**
  https://www.carnegiefoundation.org/

Thank you!

- Carnegie Foundation for the Advancement of Teaching
- Jonathan Dolle, WestEd
- Sola Takahashi, WestEd

Thank you!

Questions?

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Development Director, School and District Services

Backup Slides


Be problem-focused and user-centered
Attend to variability
See the system
Embrace measurement
Learn through disciplined inquiry
Organize as networks
6
CORE PRINCIPLES OF IMPROVEMENT
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Engine for Learning: The PDSA Cycle

Practical Measurement

Practical measures are measures that act as sensing mechanisms at the level at which work is carried out. They are "practical" in that they can be collected, analyzed, and used **within the daily work lives** of practitioners. They are also "practical" in that they **reflect practice**. Practical measures are used to identify improvement targets and to learn continuously whether the changes we introduce are improvements.