Systems Thinking to Improve Student Outcomes: Introduction to Improvement Science

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

1) 0 – 10,000
2) 10,000 – 20,000
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, about 841 million people flew on commercial airlines in the United States.

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
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?
Why is flying so safe?

RESEARCH  ACCOUNTABILITY  LEARNING
Why is flying so safe?
Why is flying so safe?
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?

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

~3,840,000 fourth graders

~3,840,000
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%?
Reading – Why only 35%?
# Three Ways Data Support Improvement

<table>
<thead>
<tr>
<th></th>
<th>Primary Audience</th>
<th>Purpose</th>
<th>Measurement Criteria</th>
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<tbody>
<tr>
<td><strong>Research</strong></td>
<td>• Scientific community</td>
<td>• New knowledge, irrespective of applicability</td>
<td>• Many</td>
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<td></td>
<td>• Policymakers</td>
<td></td>
<td>• Complex collection</td>
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<td></td>
<td>• Decision makers</td>
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<td>• Parents</td>
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<td>• Understanding of process</td>
<td>• Few</td>
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<tr>
<td><strong>Learning</strong></td>
<td>• Principals</td>
<td>or student learning</td>
<td>• Easy to collect</td>
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<td>• District Leaders</td>
<td>• Motivation and focus</td>
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<td>• Managers</td>
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<td>• Evaluation of changes</td>
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| Accountability | • Parents  
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|           |                        | • 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 |
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

It is a success
Distribution of RCT Treatment Effects: Reading Recovery
N=141 schools
Distribution of RCT Treatment Effects: Reading Recovery
N=141 schools

Count

Effect Size

Undesirable/Weak Outcomes
Positive Deviants

34
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

Learning through testing

- 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?
Components of a Learning System

- Working Theory
- Disciplined Testing
- Data
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
Investigating a Problem as a Team

Divide up the work
Learning as a Team

Consolidate insights!
Improvement Science

Social learning

Systems-focused

Non-Linear

Disciplined
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
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?
Contact Information

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  Director, New York School and District Services

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  Senior Researcher

Joe Sassone: jsasson@wested.org
  Development Director, School and District Services
Backup Slides
6 CORE PRINCIPLES OF IMPROVEMENT

1. Be problem-focused and user-centered
2. Organize as networks
3. Attend to variability
4. Learn through disciplined inquiry
5. See the system
6. Embrace measurement
Engine for Learning: The PDSA Cycle

**ACT**
- Next steps: Adapt, adopt, abandon

**PLAN**
- What’s your change?
- What’s your prediction?
- Plan to conduct test

**STUDY**
- Compare results to prediction
- What did you learn?

**DO**
- Execute test
- Collect data, document observations

Next steps: Adapt, adopt, abandon
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.