



Principles of Improvement Science

“We need smarter systems, organizations capable of learning and improving, that see learning and change as what it means to be vital, to be alive.”

Tony Bryk, President, Carnegie Foundation for the Advancement of Teaching

What is improvement science?

Improvement science is a set of principles and tools centered on helping schools improve faster and more strategically. In the face of incredibly complex systems and deep-seated problems of educational inequity (i.e., problems with complicated, unclear, or changing conditions), school leaders require advanced skill sets to analyze situations, advance solutions, and create new tools and processes that advance more equitable student outcomes. Improvement science origins come from the healthcare industry and from a long and rich study of continuous improvement in other industries. It is fast becoming an emerging movement in school improvement, championed by the Carnegie Foundation for the Advancement of Teaching. Carnegie, in its groundbreaking book, *Learning to Improve*¹, advances six principles for improvement, each of which is detailed below.

1. Make the work problem-specific and user-centered.

Improvement science attempts to address problems of practice in education and thus spends time trying to understand - from the perspective of those closest to the issue - how and why we struggle closing the gaps between what we expect of our students and the outcomes we get. Rather than proposing solutions from afar or trying to guess what the answer might be, end users are engaged regularly so that leaders understand the root cause of the problem from their perspectives. For schools, this is most commonly school based staff. What do they experience? What barriers do they face? What school practices are occurring (or not) that lead to undesired outcomes?

2. Focus on Variations in performance.

Variation across systems, schools and within a school is a natural (though often systemic) function of complex educational systems. Understanding and accounting for variability is essential in improving student learning. Improvement science suggests that “implementation with fidelity” may not be effective when we interpret it as doing the exact same thing in the exact same way in schools and classrooms that have dramatically different contexts and circumstances. When educators use evidence-based practices and adapt them to the unique needs and circumstances of students they teach, we can begin to “implement with integrity” .

¹ Bryk, A.S., et al (2015). *Learning to Improve: How America's Schools Can Get Better at Getting Better* (Boston, MA: Harvard Education Press).

3. See the system that produces the current outcomes.

Teaching and learning do not exist in a vacuum. Each student and teacher works and learns in a complex social organization. Local education systems, along with the larger social, economic, and political systems in which we live, have a significant influence on the problems of practice educators seek to improve. Even when we might have little influence in changing systems, understanding these systems and how they influence the problems we face is essential in making meaningful improvements in the areas we influence.

4. We cannot improve at scale what we cannot measure.

Data on school and student outcomes have become an essential component of how we measure progress and success in schools. This outcomes data, while essential, is not sufficient in helping us improve at scale. We must add a suite of other measures to answer the questions such as “Is this change we have implemented effective?” “Is this change actually happening as we predicted?” In schools, teachers and administrators are often the best at this kind of measurement, using multiple formative measures to capture learning, analyze effectiveness, make decisions, and adjust instruction.

5. Use disciplined inquiry to drive improvement.

Disciplined inquiry is a process of testing and scaling change that intentionally move school systems away from more traditional “roll-out” of programs and initiatives that often scale fast and fail big. It is characterized by an approach to change that is iterative (“possibly wrong, and definitely incomplete”) and cyclical (start small and fail fast). Improvement science uses three questions to drive inquiry about improvement.

- What specifically are we trying to accomplish and for whom?
- What changes might we introduce and why?
- How will we know that a change is actually an improvement?

6. Accelerate learning through networked communities.

Building off of the other five principles, improvement science organizes schools into Networked Improvement Communities (NIC), which bring educators, leaders, researchers, and other experts together across contexts to accelerate learning by working to solve shared problems. Moving beyond simply sharing ideas, a NIC allows participants to learn from each other, problem-solve collaboratively, and test (and adapt) potential changes within their own settings. The end result is that schools benefit from the perspectives of a larger group of educators and expand their collective capacity outside of the wall of their school building.

“Educational inequities rooted in race and poverty may only be completely eradicated by significant systemic change. Yet, committed educators applying improvement science principles can lead meaningful improvements in learning and equity for the students in our classrooms right now.”

Segun Eubanks, Director, Center for Educational Innovation and Improvement