

# Updating the Theory of Change

By Ellen Eliason Kisker

A theory of change is a succinct description of a program or approach and the mechanisms through which it is expected to improve its targeted outcomes. It is a useful tool for stakeholders to communicate with others about the program and its expected benefits. An explicit theory of change also provides a foundation for evaluating the program.

## The Teachers Institute Theory of Change Maps Pathways to Teacher and Student Outcomes

The Teachers Institute theory of change (Figure 1; Kisker 2011) describes how program founders designed the Teachers Institutes to improve teaching and student learning. The Understandings and Procedures of the Yale National Initiative (2007) provide a clear description of the essential features of the Teachers Institute approach. The theory of change identifies the immediate products, intermediate outcomes, and longer-term outcomes that are expected when the Teachers Institute program is implemented as intended.

The theory of change has a longitudinal dimension that is difficult to illustrate but crucial for understanding the potential impact of Teachers Institutes. Over time a significant proportion of district teachers will participate, and some teachers will participate in multiple years. In New Haven, for example, during the period from 1992 to 2017, 527 teachers participated. Half participated more than once, one quarter participated more than twice, and nearly one tenth participated at least five times (Kisker 2018a).

Higher teacher retention compounds the benefits for students over time. Teachers who stay continue to use Institute-developed curriculum units and apply their enhanced knowledge and classroom practices in teaching future cohorts of students. They provide leadership and continue to

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foster collaboration and higher morale and collegiality among teachers.

Curriculum units are available for use by other teachers, further extending the potential effects of the Teachers Institute seminars. While the extent of unit use by other teachers remains uncertain, a recent survey of New Haven teachers estimated that 11% of other teachers had used Institute units. A pop-up survey of Web site users over 17 months identified thousands of teachers across the country and around the world who had used or planned to use Institute curriculum units they found online (Kisker 2018b).

## Research and Best Practices Support the Teachers Institute Theory of Change

The Teachers Institute theory of change is grounded in the founders' vision for the program, affirmed by participating teachers' reports about their experiences and the benefits of participating, and backed by research and experts' current understanding of best practices.

### *What Participating Teachers and Program-Sponsored Research Say*

Outcomes research conducted by the Yale-New Haven Teachers Institute and Yale National Initiative shows that participating teachers consistently rate their Institute experience as valuable. From 1992 to 2017, three quarters of all New Haven teachers who participated reported at the end of the program that the program was useful to them to a great extent, and the others indicated that the program was useful to a moderate extent (Kisker 2018a). Annual surveys conducted in four Institutes that asked participating teachers to compare their Institute experience with other professional development programs rated the Institute programs higher than other programs in developing knowledge, skills, enthusiasm, high expectations of students, and capacities to motivate students (Smith 2004).

End-of-program surveys of Institute Fellows in New Haven support many of the pathways identified in the theory of change. After participating in the Institute,

almost all of the 1992-2017 Fellows agreed (many strongly) that their seminar helped them grow professionally and intellectually and that they gained knowledge of their subject and confidence in their ability to teach it. Most agreed that they have higher expectations of their students' ability to learn about the seminar subject, and two thirds agreed that they learned new teaching strategies from other participants in their seminar and that their seminar provided useful feedback about teaching. The majority of 2014-2017 Fellows agreed that the seminar gave them opportunities to work on their teaching, led them to seek information from others, led them to think about teaching in a new way, and made them pay closer attention to their teaching (Kisker 2018a).

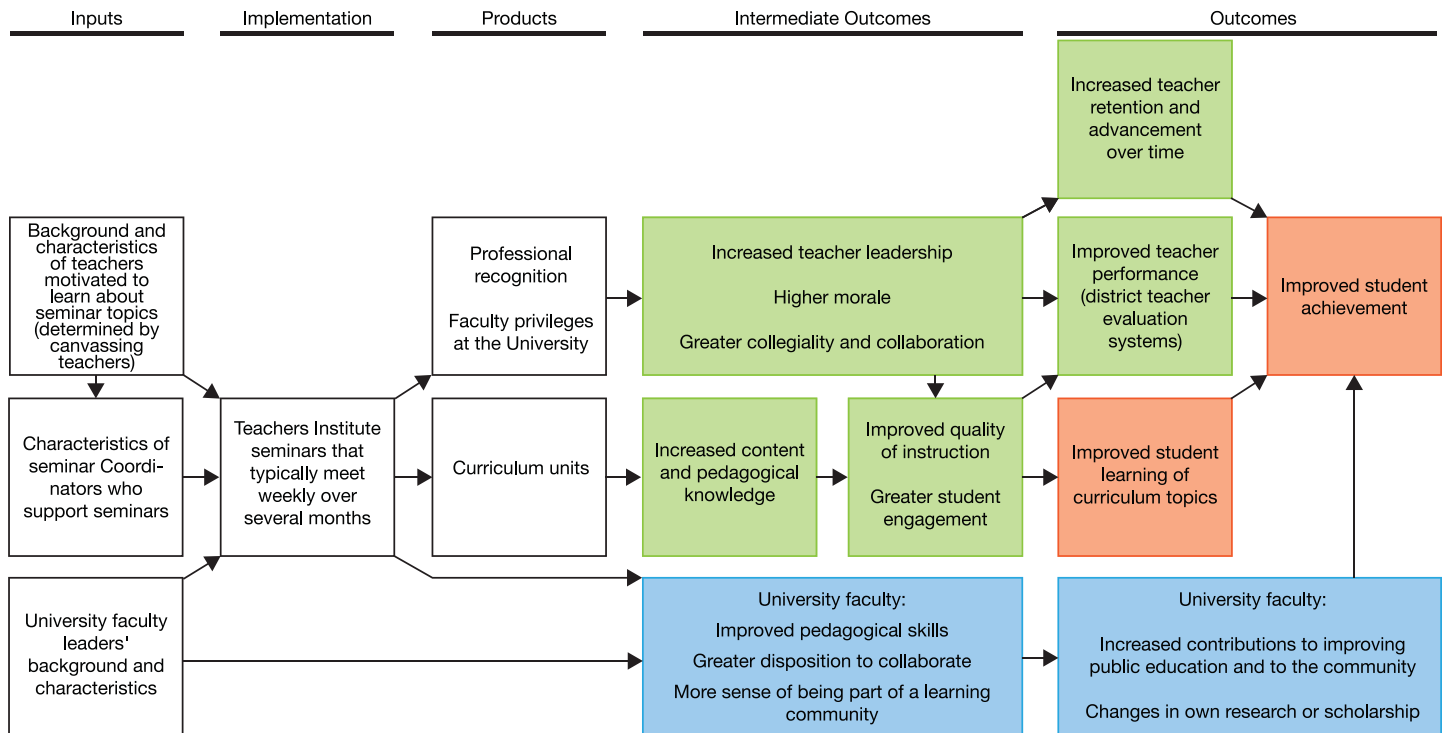
Curriculum units forge a strong link between Institute seminars and teachers' classrooms. Nearly all Fellows use the units they write, sharing some aspect of what they learned in their seminar with their students. Institute curriculum units, which focus on subject matter and teaching strategies but do not include complete lesson plans, can be used in a variety of ways. New Haven Fellows who responded to an online survey in 2016 or 2017 were most likely to implement their own units as written or with adaptations. Many Fellows also used the teaching strategies or subject matter from the unit to prepare for teaching other materials (Kisker, 2018b).

When using Institute units, other New Haven teachers and teachers who found Institute units online were most likely to read the teaching strategies or subject matter in the units to get ideas or prepare for teaching their own curriculum. Many reported that they read the bibliography to identify other resources or shared the unit with another teacher who might be interested (Kisker, 2018b).

Institute curriculum units are well-regarded. In New Haven, nearly all teachers who responded to the online survey were satisfied with the units they had used and planned to implement again the unit

# Kisker: Updating the Theory of Change

Figure 1. Theory of Change for Teachers Institutes



they had used most recently. Fellows and other teachers in New Haven who had used Institute curriculum units as written or with adaptations reported that they compared favorably to commercial curriculum materials they had used (Kisker, 2018b).

Smith (2009) reported that Teachers Institutes are influential in retaining existing teachers because participating teachers find the seminars stimulating and feel “respected and acknowledged as creative, caring educated colleagues.” Quantitative analyses of data in New Haven confirm this. Of those teachers who had been Institute Fellows by the end of the 2000-2001 school year, nearly two thirds were still teaching in New Haven in 2004-2005, compared with fewer than half of other teachers. Fellows were almost twice as likely as non-Fellows to remain teaching in the district five years later, controlling for differences in race, sex, and years of teaching experience (Smith, 2009, p. 24).

The majority of participating teachers rate student attention, motivation, interest, and

content mastery as higher during Institute-prepared curriculum units compared with other curriculum units (Smith 2009). A retrospective analysis of student achievement outcomes during the 2000-2001 to 2004-2005 school years, however, did not find significant effects of the Teachers Institutes on student achievement test scores or course grades. This was not unexpected, because the curriculum units were not designed to align with achievement tests. Smith (2009) concluded that student outcomes data more closely tied to the goals of the Institute-prepared curriculum units, or more extensive and reliable data on student outcomes more generally, is required to demonstrate Institute impacts on students.

### What Other Research Says

Strong causal research on the effectiveness of teacher professional development (PD) is still limited but growing. Not all rigorous studies have found positive effects on student achievement, but many well-designed studies have (Darling-Hammond et al. 2017). These studies show that teacher PD

can improve the intermediate and longer-term outcomes that the Teachers Institutes are designed to influence.

A number of studies suggest that PD can increase teacher content knowledge and pedagogical content knowledge. Of the 25 evaluation studies reviewed in Blank, de las Alas, and Smith (2008), for example, 10 reported evidence of measurable effects on teacher content knowledge. More recently, Heller et al. (2012) evaluated three PD interventions that all focused on building teachers’ content knowledge and pedagogical content knowledge in science, taking three different approaches. All three increased teachers’ content knowledge and student test scores significantly, and analyses showed that the effects on students were achieved in part through the programs’ effects on teacher content knowledge.

Research has also demonstrated that increased content knowledge can influence classroom practices. For example, Hill et al. (2008) examined associations between mathematical knowledge for teaching and

the quality of mathematical instruction and found a significant, strong association between them.

Studies have also shown that teacher PD can have a positive impact on classroom practices. Scher and O'Reilly (2009) conducted a meta-analysis of strong causal studies and found that the pooled effect size of math and/or science PD on teacher practice was .63 and highly significant.

Several studies point to the value of PD that supports teachers in developing their own curriculum. Carpenter et al. (1989) evaluated a PD program that made teachers aware of research findings, then supported them in developing curriculum units. The evaluation documented positive effects on teacher knowledge, improvements in observed teacher practices, and higher student achievement. McCutchen et al. (2002) provided an instructional institute for teachers focused on increasing teacher knowledge and supporting teachers in developing their own curriculum around what they learned. The evaluation documented positive effects on teacher knowledge and improvements in observed teaching practices.

Teacher PD also can have a positive impact on student attitudes and student perceptions. Scher and O'Reilly (2009) found significant pooled effect sizes of math and/or science PD on student attitudes (.42) and student perceptions (.57).

The ultimate goal of teacher PD is to increase student learning and achievement. Yoon et al. (2007) identified nine studies of PD that met What Works Clearinghouse evidence standards. All nine studies employed workshops or summer institutes for elementary school teachers and focused on a range of content areas. Most reported effects on student achievement were positive; 8 were statistically significant, and 9 of the remaining 12 were substantively important, with effect sizes of at least .25. The average effect size was .54.

The meta-analysis conducted by Scher and O'Reilly (2009) also found positive effects on student math and science achieve-

ment, with pooled effect sizes ranging from .12 to .38. Blank, de las Alas, and Smith (2008) found that one third of the evaluation studies they reviewed reported measurable effects of teacher PD in math and science. Darling-Hammond et al. (2017) identified 35 studies with strong evaluation research designs (experimental or quasi-experimental design) or analyses with appropriate statistical modeling and controls for context and student characteristics that demonstrate positive effects on students.

#### ***What Experts Say***

To help states and school districts making decisions about teacher learning and development, organizations providing technical assistance have synthesized research results and advice of experts to identify features and practices that make it more likely that a teacher PD program will be effective. The National Comprehensive Center for Teacher Quality, for example, identified five features of high-quality PD: (1) alignment with school goals, district standards and assessments, and other professional learning activities; (2) focus on core content and modeling of teaching strategies for the content; (3) inclusion of opportunities for active learning of new teaching strategies; (4) provision of opportunities for collaboration among teachers; and (5) inclusion of embedded follow-up and continuous feedback (Archibald et al. 2011).

More recently, Darling-Hammond et al. (2017) examined rigorous studies of PD programs that demonstrated positive effects on teaching practices or student outcomes to identify common features of these programs. They found that effective teacher professional learning includes most or all of seven widely shared program features: (1) a focus on teaching strategies associated with specific curriculum content; (2) active learning to engage teachers directly in designing and trying out teaching strategies; (3) support for teachers to share ideas and collaborate in their learning; (4) use of curricular models and modeling of instruction to show teachers what

best practices look like; (5) sharing of expertise about content and evidence-based practices, focused directly on individual teacher needs; (6) built-in time for teachers to think about, receive input on, and make changes to their practice by facilitating reflection and soliciting feedback; (7) sustained duration.

The Teachers Institute approach encompasses many of these recommended best practices: (1) each Teachers Institute is aligned with school reform goals and is designed to support a district's strategic plan, and the curriculum unit each teacher develops is aligned with state and local standards; (2) Institute seminars deepen teachers' knowledge of core subjects and assist them in developing strategies to teach their own students what they have learned; (3) teachers are active learners in Institute seminars, receiving feedback from their peers and often trying out the units with their students as they prepare them; (4) the collegial exchange of ideas and sharing of expertise among school teachers and university faculty members lies at the very center of Institute seminars and is a tenet of the Institute approach; and (5) Institute seminars are of substantial duration, involving a minimum of 26 hours in session plus substantially more time for meeting with seminar leaders, researching seminar topics, and writing curriculum units. Teachers Institutes are planned, implemented, and sustained by teachers. Each Institute seminar topic is suggested by teachers based on what they think will enrich their classroom instruction. Teachers recruit their colleagues to participate, and one teacher in each seminar plays a coordinating role to handle administrative details, help establish collegiality, and act as a resource for other teachers.

#### **The Theory of Change Needs to Be Tested Using a Strong Evaluation Design**

The Teachers Institute theory of change has a solid foundation in experience and research, but it is still a theory that needs more testing with research designed to assess the causal relationships in the theo-

ry. Evaluation of the Teachers Institute approach employing a strong causal research design to explore the pathways and measure the magnitude of Institute impacts on intermediate and longer-term outcomes is needed to confirm that the theory of change provides an accurate map from Institute participation to outcomes.

#### Note

1. All effect sizes cited are in standard deviation units.

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