ACCOMPLISHING EFFECTIVE AND DURABLE CHANGE TO SUPPORT IMPROVED STUDENT OUTCOMES

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From one cohort to the next, the lessons learned are used to benefit current and future states. http://sisep.fpg.unc.edu/

About the State Implementation and Scaling up of Evidence Based Practices (SISEP) Center The SISEP Center is a project of the National Implementation Research Network (NIRN) and is funded by the U.S. Department of Education's Office of Special Education Programs (OSEP). The purpose of the SISEP Center is to help establish implementation and scaling capacity in state, regional, and district educational systems. SISEP provides content and technical assistance toward establishing large-scale, sustainable, high-fidelity implementation of effective education practices. Our shared goal is to maximize academic and social outcomes of all students, especially students with disabilities.

The SISEP Center also provides technical assistance to increase knowledge of evidence-based implementation supports for evidence-based practices in Charter Management Organizations, Local Education Agency Superintendents and other leaders, and Technical Assistance Centers and projects funded by the U.S. Department of Education's OSEP.

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INTRODUCTION

Kentucky's educators are creating systemic change to produce noticeable improvements in learning for all students. Systemic change has vexed education systems for decades (Tyack & Cuban, 1999). In recent years, it has become clear that implementation science is the missing ingredient in efforts to purposefully improve student outcomes in state systems (Fixsen, Blase, Metz, & Van Dyke, 2013; Fixsen, Blase, Ward, Jackson, & Coffey, in preparation). The Kentucky Department of Education (KDE) has taken a thoughtful and persistent approach to systemic change in partnership with its educators and communities. Kentucky has documented the initial changes in the education system and the benefits to system alignment and cohesion for improved outcomes. We summarize a few of the key actions of Kentucky's educators here, as well as some of the results of their efforts so far. In August of 2014, with the intensive support of the State Implementation and Scaling up of Evidence Based Practices (SISEP) Center, Kentucky began to develop its implementation infrastructure and capacity, with goals for student learning in the area of math, as they developed the knowledge and skills to use the Active Implementation Frameworks (See Appendix A: Fixsen, Naoom, Blase, Friedman, & Wallace, 2005).

# IDENTIFYING AN AREA OF FOCUS TO DEVELOP AN IMPLEMENTATION INFRASTRUCTURE

Designing an implementation infrastructure and refining implementation efforts requires an area of focus. The heart of the Kentucky Department of Education's Active Implementation work is the State Systemic Improvement Plan (SSIP). The SSIP fosters use of a *Learning Laboratory* where Implementation Teams are engaging in trial and learning. Specifically, their State Identified Measurable Result (SiMR) goal is to improve math outcomes for students in the Commonwealth by *"increasing the percentage of students with disabilities performing at or above proficient in middle school math, specifically at the 8th grade level, with emphasis on reducing novice performance, by providing professional learning, technical assistance and support to elementary and middle school teachers around implementing, scaling and sustaining evidence-based practices in math."* The federal SSIP mandate provides support for the scaling work in Kentucky and other states.

The implementation infrastructure is the foundation for effective use of any practice through organizational alignment and use of three types of *Implementation Drivers* (Fixsen, Blase, Naoom, & Wallace, 2009; Bertram, Blase, & Fixsen, 2015; Metz & Bartley, 2012). For the purpose of a common term, *innovation* will be used in this paper to describe any new practice, program, or intervention used by teachers in the classroom. *Competency* Drivers focus on selection, training, coaching, and use of a fidelity measure to develop the confidence and skill of staff to use a practice effectively. *Organization* Drivers make use of a comprehensive data system to resolve barriers to implementation at the practice and organizational level. *Leadership* Drivers guide the resolution of adaptive and technical barriers at all levels of the education system, from KDE to the region, district, school, and classroom (Heifetz & Laurie, 1997).
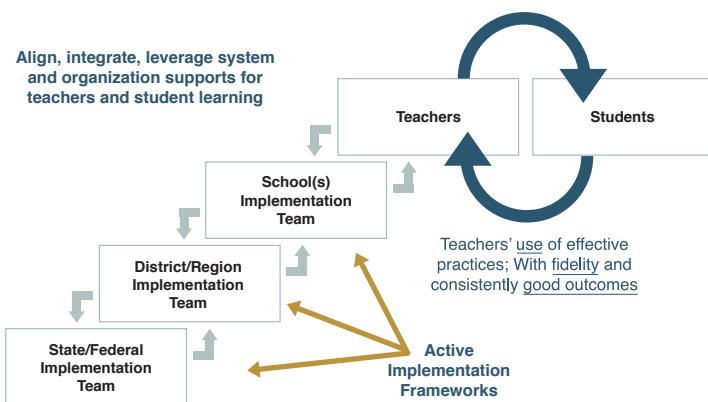
Implementation Drivers

The implementation infrastructure is the building block to support effective practice through organizational alignment and use of the Implementation Drivers (NIRN, 2013).
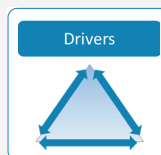
LEADING SYSTEMIC CHANGE: THE CRITICAL ROLE OF THE STATE TRANSFORMATION SPECIALIST AND THE STATE MANAGEMENT TEAM

Developing implementation capacity (knowledge, skills, abilities) is reliant upon the State Transformation Specialists' intentional and continuous development of the knowledge and skills to use implementation research and practices themselves, and in the first cohort of linked Implementation Teams: teacher, school, district, region, and the state. *Linked Implementation Teams (See Figure1)* define, develop, and monitor the use of an implementation infrastructure by districts and their schools to help assure dramatically and consistently improved student outcomes.

Figure 1
Linked Implementation Teams
A Cascading System of Supports for Systemic Change in a Transformation Zone.

Align, integrate, leverage system and organization supports for teachers and student learning

Teachers

Students

School(s) Implementation Team

District/Region Implementation Team

State/Federal Implementation Team

Teachers' use of effective practices; With fidelity and consistently good outcomes

Active Implementation Frameworks

Two State Transformation Specialists are leading the state's Active Scaling work in partnership with SISEP and KDE executive leadership (known in this paper as the State Management Team), implementation workgroups, Regional, District and School Implementation Teams, teachers and community shareholders. Together, they develop the readiness and capacity of individuals and teams to use the best available evidence from implementation science research and practice. State Transformation Specialists help to assure the success of the overall implementation infrastructure and scaling-up capacity in the state. They initiate and serve as core members of the State Management Team and regularly use data to communicate successes and barriers to solve. They ensure that Practice to Policy and Policy to Practice Feedback Cycles are used to leverage existing resources, reduce waste, and create alignment and cohesion from the classroom to the state – all to support continuous improvement of teacher practice and improved student outcomes. Accountability rolls uphill to the Implementation Team with the authority to remove barriers in districts, schools, and classrooms. The onus is no longer on the individual teacher to improve outcomes; the onus is on implementation teams who take responsibility for effective use of practices in the classroom.

> *"It is helpful when SISEP and State Transformation Specialists 'lean in' to help us improve our processes."*
>
> —— Implementation Team Member

State, regional, and district executive leadership commit to meeting every month to analyze capacity and implementation data in support of implementation teams and fidelity of teacher practice to improve student outcomes. There are three main aspects of *capacity measurement*, which provide information about the systems, activities, and resources required to initiate and sustain improved student outcomes by teams at every level of the system. *Fidelity* measures the extent an innovation is used as intended by teachers in the classroom. *Outcome* refers to both interim and summative student data. In time, teams at every level of the system are in place, collecting and using capacity, fidelity, and outcome data for action planning and monitoring goal attainment. *Implementation data* are used to measure the systems of support (training, coaching, data use) to support effective teacher practice.

State Transformation Specialists become experts in coaching implementation teams to use the *Implementation Stages*, a non-linear process to *Explore* and mutually agree to *Install* teams and the necessary supports for effective use of a practice.

Then, they provide the intensive support needed during *Initial Implementation* when teachers begin to use a new practice. Over time, often three to five years under optimal conditions, organizations attain *Full Implementation* as effective teacher practice produces notable improvement in student outcomes. The first group of Kentucky's educators who mutually agreed to participate are dedicated to developing and sustaining linked Implementation Teams in a Cascading System of Supports from the state to the region, district and school—all in support of effective teacher practice (Blase, Fixsen, & Ryan Jackson, 2015) (Figure 1). Systems cannot change all at once (Blase, Fixsen, Sims, & Ward, 2015). Instead, change is initiated and the intended and unintended outcomes of change are managed in a Transformation Zone (Fixsen, Blase, & Van Dyke, 2012). In this paper, we describe how Kentucky's first Transformation Zone is leading systemic change. This first Transformation Zone is comprised of two Regional Education Agencies (known in Kentucky as Cooperatives), one very large district that is a Cooperative (represented in the district data in this paper), 5 districts (large urban to small rural), 7 schools, and 44 teachers.

Capacity measurement refers to the systems, activities, and resources required to initiate and sustain improved education outcomes.

Implementation Stages

Exploration, Installation, Initial and Full Implementation outline the integrated, non-linear process of deciding to use an effective innovation and finally having it fully in place realizing promised outcomes (NIRN, 2013).

Stages
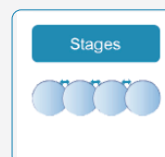
# THE PIVOTAL ROLE OF THE REGIONAL EDUCATION AGENCY

Another critical role is that of the Regional Educational Agency. Regional Implementation Teams are the link between the state and its districts, schools, and teachers. Regional Implementation Teams take responsibility for the development of implementation capacity in their districts with the support of the State Transformation Specialists and SISEP. They leverage improvement efforts (Fixsen, Blase, Ward, & Sims, 2014). As liaisons, the Regional Implementation Teams meet monthly with district and school leadership. Teachers and school staff report barriers to effective practice, so the District, Region or State Management Team can remove them through rapid response. Implementation Teams, at every level of the system, take responsibility for implementation as they select, install, and sustain practices that are responsive to teacher and student need. When teachers see barriers removed in support of their effective practice, they feel empowered. Principals and teachers no longer feel burdened to "do it all." Instead, they create a shared vision of collective commitment and accountability.

Two Regional Cooperatives and one of the larger districts in the United States agreed to participate in the first Transformation Zone: Ohio Valley Educational Cooperative (OVEC), Southeast/Southcentral Educational Cooperative (SESC), and Jefferson County Public Schools (JCPS). OVEC serves over 55,000 students in 14 districts, in 12 counties in north central Kentucky. SESC serves 81,000 students in 27 districts, in 16 counties in southeast and southcentral Kentucky. Jefferson County Public Schools serve over 100,000 students in 172 schools. (See *Figure 2.)* The first step is the careful selection and design of the initial Transformation Zone.

A Transformation Zone is a representative portion of the state system (urban and rural districts with varied size and demographics), typically comprised of two to three geographic regions. In each region, initial transformation work is focused on one to three districts and one to three schools in each district (depending on the size of the district). A Transformation Zone is small enough for Implementation Teams to be established at every level of the system and to develop the capacity of each team (knowledge and skills to use implementation science research and practice) and thus become functional. Yet, it is also large enough to "disturb the system" and uncover long-standing barriers to effective use of practices designed to improve student learning.

Figure 2

Transformation Zone

Special Education Service Regions

Legend: WKEC, GRREC, J.C.P.S., OVEC, NKECS, CKEC, SE/SC, KVEC, KEDC
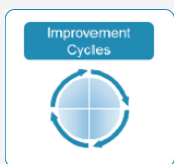
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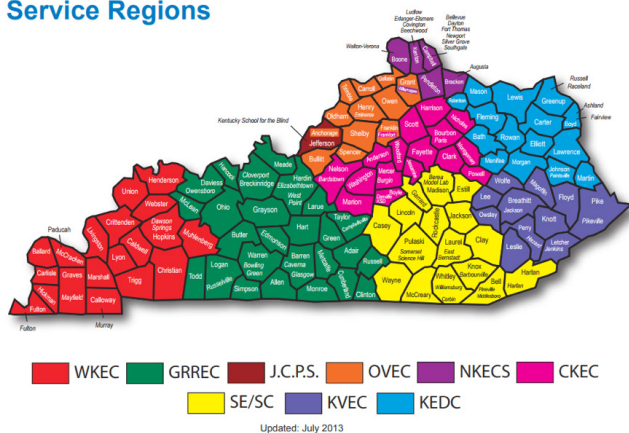
Implementation Teams act as "sensors" who identify successes and barriers based on the valuable feedback from families, teachers, schools, districts, and regions. In turn, successes are replicated and barriers are lifted to the team that has the authority and resources to sustain success and surmount barriers. Resolution of barriers requires intentional use of data for problem solving, solution development, and action planning that is monitored for success using *Improvement Cycles* (Plan-Do-Study-Act; PDSA) to support intentional, systematic change. In time, (usually 3-5 years) the system can be replicated in the second Transformation Zone, more quickly, and with a high degree of probability that the systems and practices will be generalized for use in any region, district, and school.

Improvement Cycles

Plan-Do-Study-Act Cycles support systematic and intentional change (NIRN, 2013).

Using SISEP's "just enough, just in time" approach, SISEP, State Transformation Specialists and Regional Implementation Teams began to *explore the readiness and capacity of districts and their schools to participate in the first Transformation Zone* in March of 2015. Using an active modeling approach ("I do, We do, You do") to teaching implementation skills, SISEP and the State Transformation Specialists modeled the use of Active Implementation activities (e.g., selection of team members and expectations regarding roles and responsibilities). Through the intentional use of iterative PDSA Cycles, regional members, State Transformation Specialists, and SISEP continued to provide coaching and implementation informed support for improvement purposes. Regional Implementation Teams also gathered four times per year for a full day to learn from one another's success and challenges, and they expressed the value of coming together.

> "
> *"The quarterly all day Transformation Zone meetings helped us learn how the other regions were developing District and Building Implementation Teams so we could replicate the process."*
>
> —— Regional Implementation Team member

Using the best evidence from implementation science to ensure teachers and school staff have what they need when they need it creates a belief in school staff that the focus is on a system of support for effective use of a practice (and not on individual teacher evaluation). Implementation Teams are persistent in their communication; the onus is no longer on the teacher and principal, but on the systems of support each teacher and principal receive to effectively use a practice to positively impact student outcomes. Shareholders in Kentucky acknowledged, *"This is a big shift in our thinking and our culture,"* as schools focused on *trial and learning* to design and refine implementation efforts in the first Transformation Zone. The aim was to hone the process so it could be scaled up successfully, with good outcomes, in the second Transformation Zone.

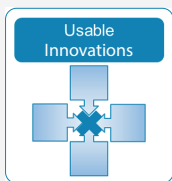> *"This is a big shift in our thinking and our culture."*
>
> —— Kentucky Shareholder

ENGAGING KENTUCKY SHAREHOLDERS

Usable Innovation

An innovation needs to be teachable, learnable, doable, and readily assessed in practice if it is to be used effectively and benefit all students (NIRN, 2013).

Simultaneously, as Implementation Teams were formed at every level of the system, the state provided the resources for a diverse team of Kentucky shareholders to develop a usable math innovation. A *Usable Innovation* is teachable, learnable, doable, and easily assessed in practice (NIRN, 2013). To begin the process of developing a usable math innovation, the state assembled a team, known as the Instructional Practices and Content Team (IPAC), with members who were carefully selected for their knowledge and skills in math content, implementation practices, and implementation capacity in regional, district, and school contexts where math innovations would be used. This diverse team was responsible for the development of the Practice Profile. For a complete description of how Kentucky developed a Practice Profile, see Kentucky's Usable Innovation Development (in preparation). Using state-provided resources, the diverse team co-created the Practice Profile so all Kentucky shareholders could see themselves in the process and final product. The complex procedure took six months to complete and it was accomplished through strong partnerships with Kentucky shareholders: state, regional, district, school staff, instructional coaches, university and community partners, and purveyors of innovations used in Kentucky's schools. This purposeful and intentional process was designed and owned by Kentucky's shareholders and educators. It ensured a quality standard for math practices in Kentucky's classrooms.

Figure 3

Kentucky's Usable Math Innovation Process

WHAT: Kentucky's Usable Math Innovation
Teachable, Learnable, Doable, and Easily Assessed in Practice
To close the gap for struggling students

WHO: INSTRUCTION PRACTICES AND CONTENT TEAM (N=20)

Diverse team with knowledge and expertise in mathematics and implementation
Higher Education ~ Regional, District, School Partners ~ State Mathematics Organizations

HOW

Surveyed educators to gather information on:

- *What* and *How* math innovations were used in districts and schools

- KY Educators' philosophy for teaching math

HOW

Gathered and analyzed research on math best practice

HOW

Evaluated widely used math innovations (N=23) for: need, fit, evidence, readiness, capacity, resources

OUTCOME
A common math Practice Profile for use with any math innovation with evidence of effectiveness

WHO: COMPETENCY TEAMS

Workgroups with expertise in training (N=9), coaching (N=20), data use (N=18)

HOW

Develop a training system of support and assessments to monitor and strengthen training effectiveness

HOW

Develop a coaching system of support and assessments to monitor and strengthen coaching effectiveness

HOW

Develop a data system to monitor and strengthen training and coaching systems of support that result in high fidelity of any innovation

OUTCOME
Training, Coaching, Data system of supports that can be replicated
for use with any innovation to support teacher practice and improve outcomes

Of equal importance were the workgroups that designed a comprehensive training, coaching, and data system to support effective use of the math Practice Profile by coaches, principals, and teachers. Once the Practice Profile was complete, some IPAC team members joined one of three workgroups responsible for developing the training, coaching, data systems, and measures. Experts in the state who were providing coaching and training on the use of math practices and data use were also mutually selected to participate in this worthy process. For a complete description of the timeline, tools, and measures, see How Kentucky Shareholders put into practice a Usable Innovation: Measuring the Independent Variable (in preparation). As Implementation Teams at every level of the system became functional, they collected and used capacity data to develop a sustainable implementation infrastructure that would eventually apply to any program, practice, or initiative.

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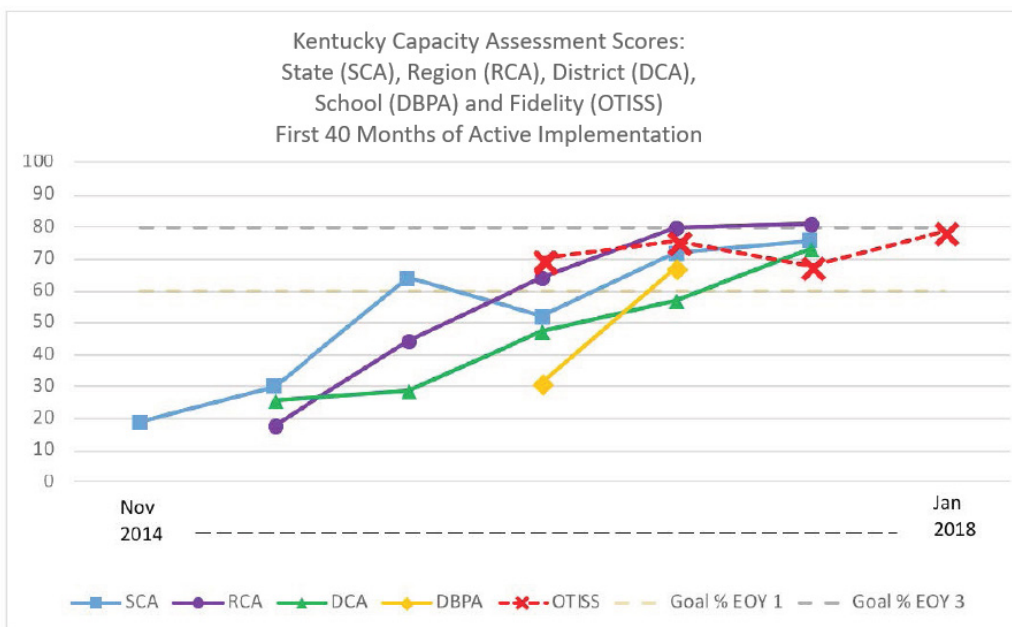# USING CAPACITY AND FIDELITY DATA IN KENTUCKY'S FIRST TRANSFORMATION ZONE

Measuring implementation capacity at every level of the system for full and effective use of a practice that benefits all students is critical to alignment and cohesion of implementation efforts. Capacity is measured using the State Capacity Assessment (SCA: Fixsen, Ward, Duda, Horner, & Blase, 2015), Regional Capacity Assessment (RCA: St. Martin, Ward, Fixsen, Harms, & Russell, 2015), District Capacity Assessment (DCA: Ward et al., 2015), and the school-level Drivers Best Practice Assessment (DBPA: Fixsen et al., 2015). Fidelity is measured using the Observation Tool for Instructional Supports and Systems (OTISS: Fixsen, Ward, Ryan Jackson, & Chaparro, 2016). Capacity development in Kentucky's first Transformation Zone took 40 months, as of January 2018.

Aggregate data in *Figure 4* represents the capacity data score (e.g., total percentage) for the State Management Team, two regions, 5 districts, and 7 schools with fidelity data from 49 teachers. See Appendix B for individual capacity assessment and OTISS graphs; SCA, RCA, DCA, DBPA and OTISS. Note, one district exited the initiative in 2017 and not all teams completed the capacity assessment every six months as suggested for best practice.

> "*Capacity assessments make it clear to me just what we need to be doing.*"
>
> —— Reflection at a Capacity Assessment

Figure 4

Kentucky Capacity Assessment Scores

Kentucky Capacity Assessment Scores:
State (SCA), Region (RCA), District (DCA),
School (DBPA) and Fidelity (OTISS)
First 40 Months of Active Implementation

Note. The Cascading System of Supports requires the state to complete the SCA first, then the region completes the RCA, then the district completes the DCA. The DBPA and fidelity data are often collected simultaneously. Best practice is to collect capacity data every six months. Some teams did not collect capacity data every six months based on team readiness. Fidelity data is collected at least three times per year to coincide with collection of math screening data. Some districts collect fidelity data more frequently. One district exited the project in 2017. See Appendix B for individual graphs.

> "We use the capacity data to develop our action plan and our action plan helps us be much more focused. With selection [the Selection Driver], we did not have a job description for a math teacher; the district did but we did not, so we looked at the district job description and added the math Practice Profile components. We used the capacity assessment questions to develop interview questions for math teachers and now we use them."
>
> —— Building Implementation Team members

Initial results suggest that the inputs at one level are the outputs at the next level. The relationship between systemic change at the state and regional level align with development of functional implementation teams at the district and school, creating a Cascading System of Supports for teachers' effective use of their district's chosen math innovation (or evidence of improved scores on the OTISS fidelity measure). Implementation Teams are encouraged to complete the capacity assessment every six months to develop action plans, and monitor progress regularly for best practice. As linked Implementation Teams establish capacity, the cascading system of supports becomes more effective and efficient as implementation skills and communication between teams strengthen and expand. The graph in Figure 4 demonstrates that the purposeful use of implementation research and practice creates systemic change from the state to the school. For an in-depth description of capacity assessment data and how teams were developed, supported, and linked see Trial and Learning in Kentucky's Transformation Zone (in preparation). The data suggest that it takes time to establish *Readiness*— a developmental point—and collective commitment to accountability as Implementation Teams are established and take responsibility for developing readiness for change. Readiness is not a pre-existing condition or an enduring characteristic of a person, organization, or system (Fixsen, Blase, Horner, Sims, & Sugai, 2013).

> *Readiness* **is a developmental point. Readiness is not a pre-existing condition or an enduring characteristic of a person, organization, or system (SISEP, 2013).**

STATE CAPACITY ASSESSMENT

Specifically, at the third administration of the SCA (64%, 18th month, March 2016) the Kentucky Department of Education met the SCA end of year one goal (EOY 1, 60% total score) as they clarified roles (e.g., liaisons between levels – state to region, region to district, etc.), how teams would function (e.g., linked communication protocols to feed barriers and successes up and down the system), and organizational structures (e.g., service delivery models for effective use of training, coaching, and data).

> "
> *"We should have been asking these questions all along."*
>
> —— Reflection by a team member at a Capacity Assessment

An *Enabling Context* is systematic and transparent communication up and down the system; soliciting feedback and using data at the practice level to inform how the system supports effective use of a practice to positively influence the policy, regulatory, and funding environments at the state level (NIRN, 2017).

REGIONAL CAPACITY ASSESSMENT

The aggregate data indicate the two Regional Implementation Teams met EOY 1 goal of 60% in an average of thirteen and a half months with a mean score of 65% (or 61% and 68%), four and a half months sooner than the state. As the State Management Team became functional, it provided an *enabling context* for the work of the Regional Implementation Teams through the use of systemic and transparent communication to quickly resolve barriers to implementation in regions and their districts (Elmore, 2002; NIRN, 2017). These regions, with the support of the State Transformation Specialists, the State Management Team, and SISEP began to develop the capacity of the five districts that mutually agreed to participate in the first Transformation Zone in the spring and summer of 2015.

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DISTRICT CAPACITY ASSESSMENT

As the state and the first Transformation Zone regions began to learn about the strengths and challenges to effectively use math innovations in districts' schools, the learning laboratory began to reveal strengths (e.g., active engagement and commitment of district executive leaders) and barriers (e.g., absence of effective training and coaching supports for teachers). The aggregate District Capacity Assessment (DCA) data in Figure 4 represents data from the five Transformation Zone districts. The data demonstrate it took twenty-four months for districts to meet EOY 1 goal of 60% (fifth administration or 74%), an average increase of 47% from baseline. Note, from the first to second administration scores remained almost flat (3% increase), suggesting it took time for districts to establish high-functioning teams, readiness, and capacity to use the best evidence from implementation research.

Simultaneously, as Implementation Teams were formed from 2015-2016, the state workgroups were developing and *Installing* training, coaching, and data systems for use in districts and their schools. Then Implementation Teams, at all levels of the system, were trained on their use. Districts used capacity data to action plan and report barriers to their Regional Implementation Team and State Transformation Specialists, so the implementation infrastructure and current systems could be strengthened and aligned.

> "
> *"The fault cannot lie in the one responsible for the repair."*
>
> —— Ross Ashby, psychiatrist and a pioneer in the study of the science of communications and systems

SCHOOL CAPACITY ASSESSMENT

In the spring of 2016, with the support of their region, State Transformation Specialists, and SISEP, districts mutually selected the first schools to participate in the Transformation Zone. In the fall of 2016, District executive leadership began to attend Building Implementation Team meetings and collect school level capacity data using the Drivers Best Practice Assessment (DBPA). The school level capacity data (DBPA) suggest that, once the state, region, and district developed the implementation infrastructure and capacity to use the Active Implementation Frameworks, the school's ability to progress at an accelerated rate was realized. The data from seven schools indicate that schools met EOY 1 goal for the DBPA in twelve months. Baseline aggregate score was 26% at the first administration and 67% at the second, an average increase of 41%.

> " *"We are much more focused and I would like to say I feel so fortunate to be part of this work. I know we are going to build teachers' capacity, but not only are we going to build it, we are going to be able to sustain it."*
>
> —— School principal in the Transformation Zone

FIDELITY ASSESSMENT

As Building Implementation Teams began to collect and use school level capacity data, they were simultaneously collecting baseline fidelity data using the Observation Tool for Instructional Systems of Support (OTISS) measure. The OTISS was developed based on Hattie's (2009) meta-analysis of over 800 meta-analyses including over 50,000 studies related to student achievement. Items on the OTISS are scored based on direct observation of teacher instruction during a 10-minute classroom walk through by a trained observer. The OTISS is scored on a 3-point scale; 2, fully observed; 1, partially observed; 0, not observed. A score of NA is also provided—no opportunity to observe. The OTISS is designed to observe teacher instruction and evaluate the implementation supports provided to teachers – it is not a teacher evaluation tool.

> "
> *At a recent SISEP Forum, a state leader asked a teacher whether there is anything you can point to that communicated the OTISS is not an evaluation.*
>
> *"Well," the teacher replied, "every time we met they kept bringing it up… 'It's not about you as an individual teacher.' So, constantly hearing that. Every meeting was very positive and organized, everything was for our purpose."*
>
> *A Regional Implementation Team member added, "We had a pre-meeting before we ever went into the classroom with all teachers. We showed them the OTISS and told them it wasn't about them: it was about the system. And we showed them the data… that there weren't going to be any names on it. They knew what we were looking for and what we were going to do with the data."*

> **"You really meant it is the system and not me."**
>
> —— Teacher participating in the SISEP Active States Forum

SISEP suggests that schools collect OTISS data at least three times per year (beginning, middle, end). It is important to note that the number of months between collection of OTISS data varied between schools. The fidelity data from six schools implies that teachers were able to meet, within one percentage point, the OTISS goal of 80% from the first observations (December of 2016) to the fourth observations (October 2017). Scores dipped to 68% at the third observation, rebounding to 79% at the fourth observation. The data suggest the OTISS is sensitive to change. Scores may dip as observers strengthen their beliefs regarding observed teacher behaviors that constitute a score of two. Scores can also dip with staff turnover as initial and ongoing training and coaching are provided based on OTISS scores. As Building Implementation Teams reviewed capacity and aggregate fidelity data, they identified barriers at the school level that the school did not have the resources to solve.

As barriers at the school level were unveiled, Implementation Teams reported barriers to the team with the authority and resources to remove the barrier. Teams, at every level of the system, created an *Enabling Context* for effective use of math innovations by teachers and school staff. Currently (2017-18 school year), implementation teams in the Transformation Zone are in Initial Implementation and using capacity, fidelity, and implementation data (training and coaching) housed in Kentucky's Data Dashboard. Teams are solving systemic barriers, strengthening the implementation infrastructure to support effective practice, and meeting school and district goals for improved math outcomes. The capacity and fidelity data typically predict improved outcomes; when capacity increases at each level of the system, then innovation fidelity and student math outcomes also should increase.

> **"I am looking forward to this process because we get to say, 'Hey, what is the next best question we can ask?'—and try to solve it."**
>
> —— Team reflection of how the Data Dashboard is used

IMPROVED STUDENT OUTCOMES

Preliminary data from one of the three districts with repeated capacity, fidelity, and proximal student data suggests *if* implementation supports are provided intentionally and with expertise (the independent variable), *then* teachers and school staff will use effective innovations consistently with fidelity and produce improved student outcomes (the dependent variable). In one Transformation Zone district (two schools and 15 teachers), the percentage of students meeting benchmark in math at the elementary and middle school level increased 29.5% during the 2017-18 school year: from 21.5% (fall 2017) to 38.5% (winter 2018) to 51% (spring 2018), based on the use of a math screening measure. The number of students scoring below benchmark decreased by 11.5% and students scoring well below benchmark decreased 18%. While this is a very small sample, it is preliminary evidence that suggests *if* implementation supports are provided, *then* schools can produce improved student outcomes. If not, teams use capacity, fidelity, and implementation data (e.g., data from training and coaching) to ask *why not?* The Learning Laboratory in Kentucky's first Transformation Zone is developing and testing the roles, functions, and implementation structures that can be scaled-up at an accelerated rate in the second Transformation Zone (installed in the winter of 2018).

This careful and intentional process increases the probability that systems change is teachable, learnable, doable, and easily assessed in practice to improve outcomes for teachers and their students.

> *"Implementation with fidelity makes change much more sustainable…. We are beginning to get data linking outcomes to use of math instruction with fidelity."*
>
> —— Teachers and staff, discussing OTISS data

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CONCLUSION

State Transformation Specialists, Regional Implementation Teams, and SISEP provided support for District and Building Implementation Teams at monthly meetings during a time when there were leadership and staffing changes in Kentucky. New roles, functions, structures, and linkages in a new system of Implementation Teams typically are fragile as they are formed and developed. On-boarding new members and continued capacity development of teams, at every level, during times of high turnover emphasizes a key role of SISEP and the State Transformation Specialists as a source of stability during potentially destabilizing events.

> " *We can readily see how this work can apply to other initiatives.*
>
> —— Kentucky educator, discussing active implementation

Equally important was the unwavering commitment and support of the members of the State Management Team. They were never distracted in their attention to the development of a state implementation infrastructure that could be replicated for use with any initiative, innovation, or mandate by their shareholders. They ensured workgroups were representative of diverse shareholders from every level of the system to establish the training, coaching, and data systems required to support teachers' effective use of math innovations in the classroom. The communication was clear and consistent: the onus was not the sole responsibility of teachers and school staff; it was on the provision and use of an implementation infrastructure to provide the systems of support—Competency, Organization, and Leadership— for teachers to use, with a high degree of fidelity, the district's chosen math innovation. The careful attention Kentucky paid to ensuring teams were representative of Kentucky's shareholders in turn allowed educators to see themselves, their philosophy, and their perspectives in the tools and resources—and this created ownership and widespread buy-in for their use. Kentucky was intentional and purposeful in the development of a sustainable implementation infrastructure. They were "making it happen."

SISEP's "just enough, just in time" strategies provide ample opportunities for teaching and learning at one level while simultaneously coaching the use of newly learned skills to develop capacity at the next level. The interconnections between the schools, district, region, and state take time to develop. As indicated in the capacity data from the SCA, RCA, DCA, and DBPA, the skills being taught, learned, and used at each level are tracked. The Active Implementation Frameworks and systems of support are used by each Implementation Team; "common language, common knowledge, common practice, and common skills" pervade each level. These implementation-informed approaches to problems and solutions promote collaboration and alignment of activities and outcomes within the state education system and, ultimately, outcomes that support schools, teachers, and student learning. Educators see that using the Active Implementation Frameworks is not merely another initiative, but a process that can accompany any program, practice, initiative, or mandate and spur effective use or full implementation for the benefit of all children and students. Proficiency in the teams' use of the core Active Implementation Frameworks and the ease of communication among the levels has provided an Enabling Context in Kentucky's first Transformation Zone as barriers are reported to the next level and solved.

In this way, practice can inform policy development, and policy can enhance effective practice in regions, districts, and schools. The result is a nimble and responsive system of supports for teachers and student learning.

> "From a statewide perspective, everything we do has to be sustainable and scalable - has to be. What we needed to do here was rapid development, we needed to incubate quite a bit, and fail forward with some ideas…we collect the fire out of data, but I don't think we effectively use data all the time, that is why this is so exciting to me, buckets of smart people with a hierarchal view – school, district, region, state."
>
> —— Chief Digital Officer, KDE

Actively using the research evidence from implementation science is complex and challenging work for Implementation Teams. Excitement is experienced every time a tipping point is reached and the excitement is often followed by the next adaptive challenge. Most often this process repeats itself for several years as readiness for the next right step is established. Then one day, the adaptive challenges become smaller, not so complex, and less frequent as the system aligns and takes another step towards producing educationally significant outcomes. The result is a sustainable permanent source of support for continually supporting effective teacher practice and improving student outcomes for every child and student.

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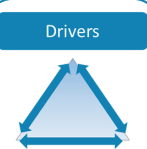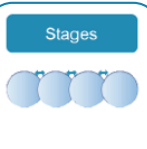
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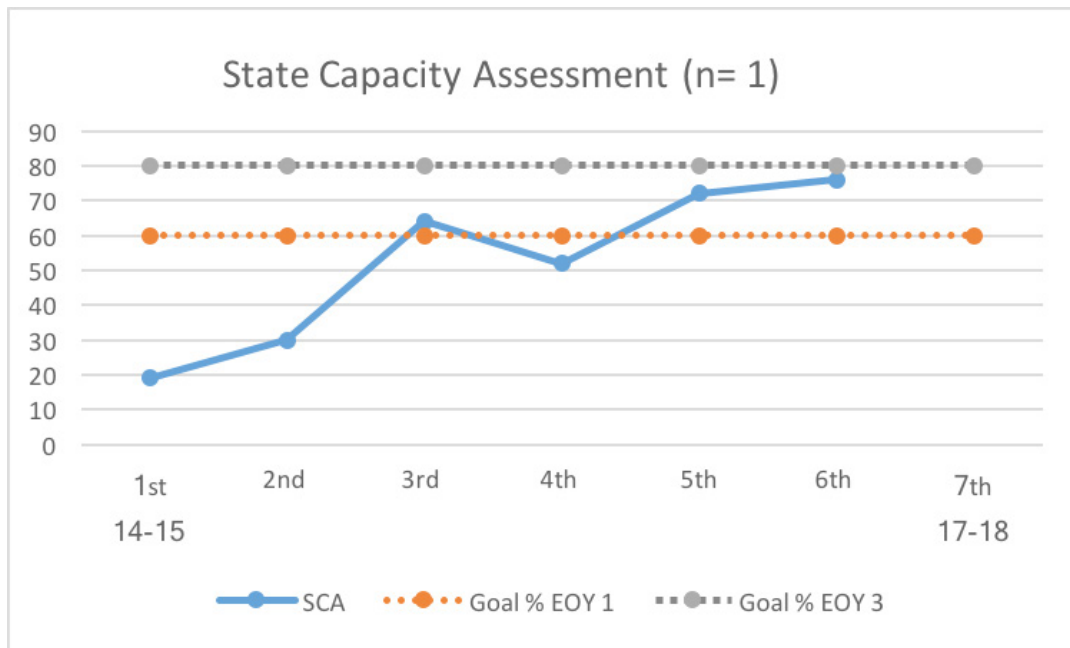
APPENDIX A

Active Implementation Frameworks

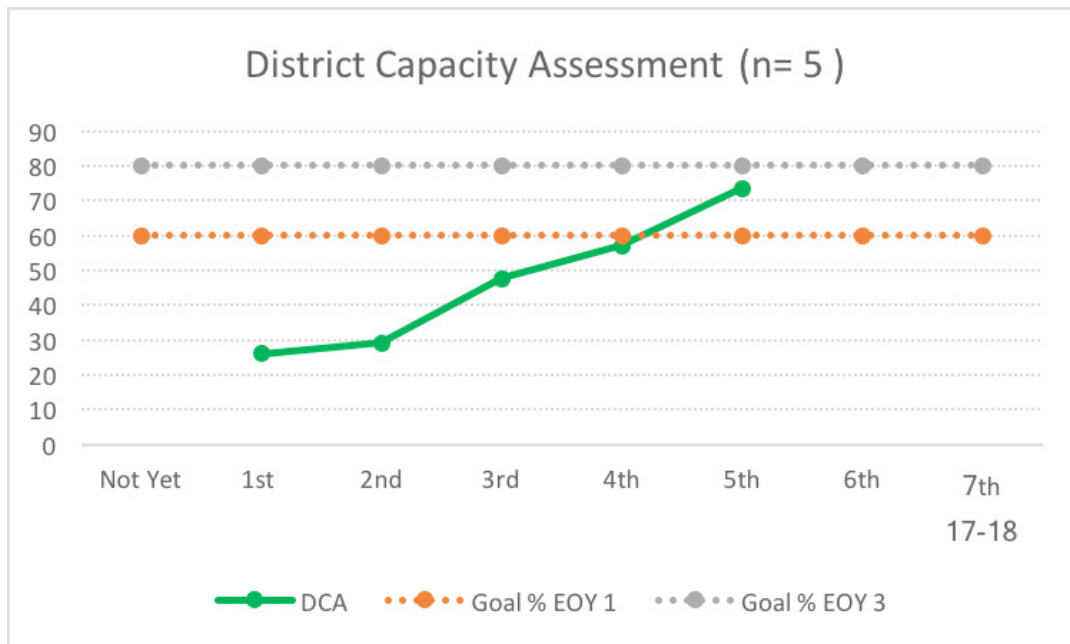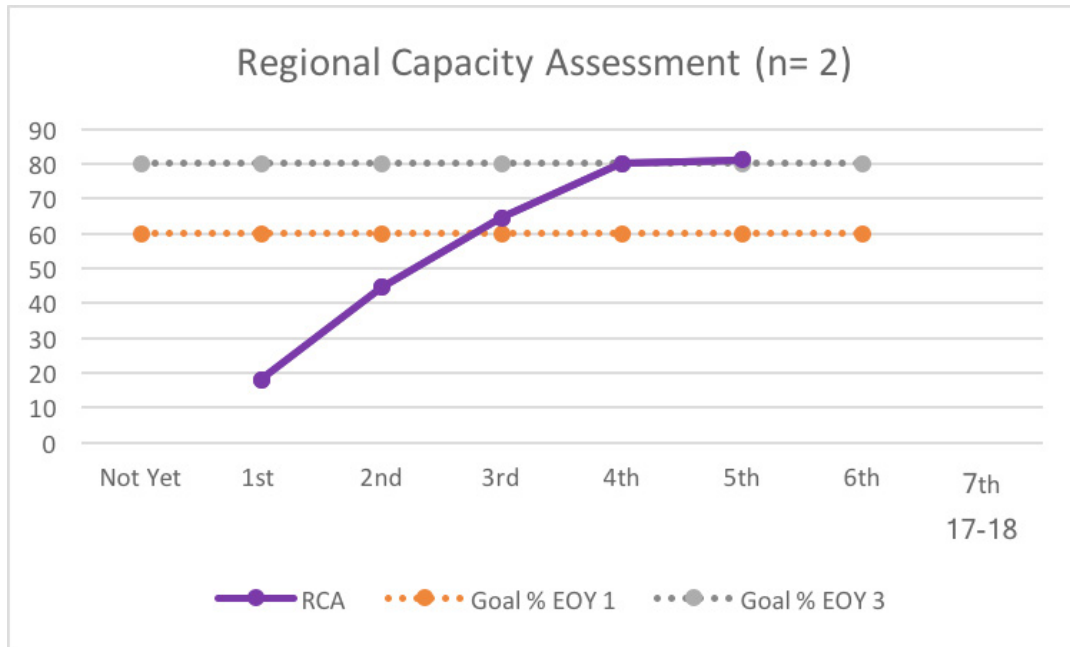|	
Usable Innovations are effective and well-operationalized. Well-operationalized innovations can be taught and coached so educators can use them as intended (with fidelity). An innovation needs to be teachable, learnable, doable, and readily assessed in practice if it is to be used effectively to reach all students who could benefit.	Usable Innovations
Implementation Teams support the full, effective, and sustained use of effective instruction and behavior methods. Linked Implementation Teams define an infrastructure to help assure dramatically and consistently improved student outcomes.	Teams
Implementation Drivers are the key components of capacity that enable the success of innovations in practice. Implementation Drivers assure development of relevant competencies, necessary organization supports, and engaged leadership.	Drivers
Implementation Stages outline the integrated, non-linear process of deciding to use an effective innovation and finally having it fully in place to realize the promised outcomes. Active implementation stages are Exploration, Installation, Initial Implementation and Full Implementation.	Stages
Improvement Cycles support systematic and intentional change. Improvement Cycles are based on the Plan, Do, Study, Act (PDSA) process for rapidly changing methods, usability testing for changing innovations and organization supports, and practice-policy communication cycles for changing systems to enable continual improvement in impact and efficiency.	Improvement Cycles

APPENDIX B

Capacity Assessment and Observation Tool for Instructional Supports and Systems Graphs

The Cascading System of Supports requires the state to complete the SCA first, then the region completes the RCA, then the district completes the DCA. The DBPA and fidelity data are often collected simultaneously. Best practice is to collect capacity data every six months. Some teams did not collect capacity data every six months based on team readiness. Fidelity data is collected at least three times per year to coincide with collection of math screening data. Some districts collect fidelity data more frequently. One district exited the project in 2017.

State Capacity Assessment (n= 1)

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APPENDIX B

Regional Capacity Assessment (n= 2)

District Capacity Assessment (n= 5)

APPENDIX B

School Drivers Best Practice Assessment (n= 7)

Observation Tool for Instructional Supports & Systems (n= 49 teachers)