

Model
Demonstration
Coordination
Center

Improving Implementation of Programs and Practices for Children with Disabilities

**Lessons Learned from
the Model Demonstration
Coordination Center**

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Glossary

AT	assistive technology
CCSS	Common Core State Standards
EI	early intervention
EL	English learner
GRA	graduate research assistant
grantee	the organization or institution that was awarded the model demonstration or technology implementation project
IDEA	Individuals with Disabilities Education Act
IEP	individualized education program
MDCC	Model Demonstration Coordination Center
MDP	model demonstration project
NIRN	National Implementation Research Network
OSEP	Office of Special Education Programs
PBIS	Positive Behavior Intervention System
PD	professional development
PLC	professional learning community
project	the intervention and implementation and research processes funded by OSEP
RDA	results driven accountability
RFA	request for applications
RtI	response to intervention
site	the organization partnering with a grantee to implement a project (e.g., school, district, early intervention program)

Executive Summary

Over the past several decades, federal agencies have been supporting researchers' efforts to develop and evaluate evidence-based intervention and early prevention programs that positively influence a diverse array of social, health, and academic outcomes. Despite this significant federal investment, a growing body of research demonstrating effective interventions, and publicly available information on evidence-based practices, widespread improvements in outcomes have not materialized, particularly for children and youth with disabilities. Fortunately, efforts to better understand how programs can be implemented well under real-world conditions have intensified, resulting in a growing knowledge base, grounded in implementation science, on the factors that appear to facilitate and impede implementation.

Addressing the gap between research-demonstrated effective programs and practices for improving outcomes for children and youth with disabilities and what schools and programs implement is part of the mission of the Research to Practice Division of the Office of Special Education Programs (OSEP) in the U.S. Department of Education. From 2005 to 2014, OSEP funded seven cohorts of model demonstration projects (MDPs), each of which has focused on a single new or promising (or perhaps poorly understood or implemented) practice, procedure, or program with evidence of high potential for improving outcomes for children and youth with disabilities. From 2012 to 2014, OSEP also funded three cohorts of Stepping-Up Technology Implementation projects, which implement evidence-based technology tools and develop and disseminate products that are intended to help schools and early intervention programs effectively implement the tools. Each MDP and technology implementation grantee implements its evidence-based model or technology tool in typical settings and assesses impacts on a target population or system.

From 2005 to 2015, OSEP also funded the Model Demonstration Coordination Center (MDCC) at SRI International. MDCC staff members worked with the cohorts of MDP and technology implementation grantees to facilitate collaborative learning within each cohort and document implementation experiences. MDCC worked with 34 grantees across the 10 MDP and technology implementation cohorts, which addressed a variety of topics. They delivered their interventions in a variety of settings and spanned the age range from infancy through high school. This breadth of implementation experiences provided MDCC with a valuable opportunity to examine such experiences across a diverse set of interventions, settings, and populations as a basis for identifying strategies grantees have used to produce high-quality implementation and sustainment of interventions. This report documents those strategies.

The report begins by providing a context for OSEP's investments in these projects (Chapter 1), a context which includes an increasing research emphasis on using evidence-based practices to improve outcomes for children and youth with disabilities and a growing recognition of the difficulty of implementing and sustaining such practices. The role of OSEP's MDCC also is described, with a focus on MDCC's grounding in implementation science principles and conceptual frameworks. Chapter 2 then discusses the stages of implementation that help structure the reporting of later findings; these stages are initiation, preparation, initial implementation, full implementation, sustained implementation, and dissemination. Key lessons grantees reported

learning as they progressed through those stages include, for example, the importance of a careful assessment of a site's readiness for implementation at the initiation stage and building implementers' confidence and skills to deliver the intervention at the preparation stage. Initial, full, and sustained implementation stages also are highlighted, along with factors that grantees reported contributed to implementation success at these stages, such as encouraging model adaptation to increase the odds of site sustainment and connecting to system-level supports, such as state dissemination networks. Strategies and tools for assessing readiness for moving from one implementation stage to the next emphasize the importance of collecting and using multiple kinds of data to determine whether sites had sufficient capacity and resources in place to advance to the next stage.

Chapter 3 points to the core components of an intervention as the primary drivers in the implementation process and highlights the importance of defining them as clearly as possible in advance of initial implementation activities yet also being open to refining them as implementation advances. Best practices for defining and adapting core intervention components are described, such as the importance of assessing the fit of the components with the implementation environment and helping sites align intervention components with local priorities and initiatives. Helping site personnel see the intervention's relative advantage by sharing results with stakeholders early and estimating the costs and resources required to implement the intervention also are recommended strategies.

The next two chapters address developing capacity for implementation at the staff and organizational levels. Chapter 4 stresses that professional development, a common and important strategy for developing staff capacity, should be provided for a long enough time to ensure that staff acquire the knowledge and skills needed for implementation with fidelity and that it involve collaborative learning among the participating staff. Other suggestions for professional development include aligning it with broader site goals and policies and supplementing distance learning, when provided, with individual in-person support. The importance of offering individual, ongoing coaching as a supplement to professional development also is emphasized, as are the benefits of providing coaching through multiple means to address the implementation support needs of individual practitioners. The chapter concludes with strategies for building the capacity of grantees' own staff members and matching their capacities to the implementation demands of specific sites.

Strategies for organizational capacity building are the topic of Chapter 5, which emphasizes the importance of developing effective partnerships with participating sites. Emphasizing collaboration, building relationships with leaders at multiple levels, as well as the practitioners responsible for delivering the intervention, and adapting to sites' needs are among the strategies discussed for developing strong partnerships. Understanding sites' readiness for implementation, developing the capacity and support of organizational leaders and other key stakeholders, and systematically working to transfer ownership of the intervention to site staff are additional recommended practices for building organizational capacity.

The importance of collecting and using evaluative feedback in support of successful implementation is underscored in Chapter 6. Developing a comprehensive formative evaluation plan, guided by a well-articulated theory of change (conceptual connection between the intervention and intended outcomes), is recommended as a first step. Acquiring data on implementation processes and contexts, including characteristics of the participating organizations and participants, and documenting key activities and processes involved in the

intervention provide a foundation for iterative improvement and help grantees prepare for replication and dissemination of their model or technology tool. The value of measuring the extent to which the implementation strategies and intervention components that were specified in the theory of change as critical to achieving desired outcomes were conducted and delivered is discussed. Using measures of social validity (the social importance or acceptability of an intervention's goals, processes, and outcomes), as well as short-term intervention outcomes to assess progress and identify challenges are also emphasized, as are ways to use multiple kinds of evaluative feedback to foster a culture of learning and reflection at implementation sites.

The final chapter points out OSEP's shift in emphasis in the last several years from ensuring state compliance with regulations to results-driven accountability for improving outcomes for children and youth with disabilities and their families. OSEP's investments in the State Implementation and Scaling-up of Evidence-based Practices Center and its funding of MDCC are examples of its increasing attention to high-quality and sustained implementation of promising or proven interventions as an avenue to achieving improved results. We point out that the MDPs and technology implementation projects learn much about how their interventions can be implemented through these grants. The logical next step for many grantees would be to test the efficacy of the whole model or technology tool package and continue to gather rigorous evidence about the components that are essential for producing desired outcomes. The role of sponsors (e.g., funders) in improving implementation research and practice is discussed, as is the importance of the development and use of high-quality implementation measures.

Over its 10 years MDCC has addressed a broad set of evaluation questions, which are included in Appendix A. That appendix also briefly describes the data sources and analysis methods used in MDCC's work and the variety of products that have resulted, most of which are available at mdcc.sri.com. In pursuing such a broad agenda over a period of years, MDCC leaders have been able to distill from grantees' varied experiences an understanding of factors that both help and hinder successful implementation. These factors have been discussed in a variety of MDCC reports and are summarized in Appendix B. Appendix C identifies a variety of tools and resources that can help developers and implementers determine the readiness of their sites to move from one stage of implementation to the next, a topic addressed in Chapter 2. Examples of the various text-based templates that have been central to MDCC's qualitative data collection strategy are presented in Appendix D.

1. Introduction

Over the past several decades, federal agencies have been supporting researchers' efforts to develop and evaluate evidence-based intervention and early prevention programs that positively influence a diverse array of social, health, and academic outcomes (e.g., Botvin, 2004; Franklin & Hopson, 2004; Han & Weiss, 2005). The Race to the Top,¹ Investing in Innovation Fund,² Institute of Education Sciences Research and Training Grant programs,³ and programs within the National Science Foundation's Education and Human Resources Directorate⁴ are but a few of the recent federal investments in improving the level of evidence for effective programs, and ultimately, the quality of education in U.S. schools. Federal funding also has supported the What Works Clearinghouse,⁵ through which educators, parents, researchers, and others can access information on educational practices, programs, curricula, and technologies that have rigorous scientific evidence linked to improved student outcomes. The impetus to find what works extends to special education, and researchers have identified a number of promising evidence-based practices and programs for children and youth with disabilities (Briesch & Chafouleas, 2009; Cook & Odom, 2013).

Yet despite these efforts, widespread improvements in outcomes have not materialized, particularly for children and youth with disabilities. Unfortunately, few evidence-based programs have successfully bridged the gap between research and practice, and without high-quality implementation of the research-based program or practices, the hoped-for positive results often have not been achieved (e.g., Greenberg, Domitrovich, Graczyk, & Zins, 2005). In the mid-1970s the RAND Corporation's "Change Agent" study of federally funded programs found that "the net return to the general investment was the adoption of many innovations, the successful implementation of few, and the long-run continuation of still fewer" (McLaughlin, 1990, p. 12). These authors reported that how well innovations were carried out was much more important than what the innovation was in predicting positive program outcomes. Decades later, that view still prevails (e.g., Glennan, Bodily, Galegher, & Kerr, 2004; Hall & Hord, 2015).

Implementation challenges are not unique to education. "The history of management practice is filled with innovations that failed to live up to the promise suggested by their early success" (Repenning, 2002, p. 109). In health care organizations, for example, an estimated two-thirds of innovation attempts fail (Greenhalgh, Robert, MacFarlane, Bate, & Kyriakidou, 2004). Moving evidence-based practices into clinical and other service-delivery settings challenges professionals across human service disciplines and geographic boundaries (American Psychological Association Task Force on Evidence-Based Practice for Children and Adolescents, 2008; Global Implementation Initiative, 2015).

Efforts to better understand how programs can be implemented well under real-world conditions have intensified over the last decade, resulting in a growing knowledge base on the

¹ <http://www2.ed.gov/programs/racetothetop/index.html>

² <http://www2.ed.gov/programs/innovation/index.html>

³ <http://ies.ed.gov/funding/overview.asp>

⁴ <https://www.nsf.gov/dir/index.jsp?org=EHR>

⁵ <http://ies.ed.gov/ncee/wwc/>

factors that appear to facilitate and impede implementation (Berkel, Mauricio, Schoenfelder, & Sandler, 2010; Dworkin, Pinto, Hunter, Rapkin, & Remien, 2008; Meyers, Durlak, & Wandersman, 2012). Overcoming implementation challenges and successfully bridging the research-to-practice gap are critical to achieving lasting and socially significant improvements for children and youth who are not succeeding in academic, social, or health domains.

The purpose of this report is to share lessons learned through 10 years of the Model Demonstration Coordination Center's work with grantees of the Office of Special Education Programs, U.S. Department of Education, who had implemented or were implementing model demonstration or technology implementation projects. The report focus is on the implications of their experiences for improving the implementation practices not only of future grantees, but also of other researchers or developers who take on the difficult task of changing programs or practices in pursuit of improved outcomes for the populations they serve.

The report begins with a description of the Model Demonstration Coordination Center, followed by a brief summary of research in implementation science, including conceptual frameworks that have been developed for understanding the implementation process. Then the implementation experiences of grantees at the various stages of implementation are described, and strategies for assessing sites' readiness to advance to the next stage are presented. The remainder of the report summarizes specific strategies that future model demonstration and technology implementation project grantees and other intervention developers can use to increase the likelihood of high-quality and sustained implementation.

The Model Demonstration Coordination Center

Addressing the gap between research-demonstrated effective programs and practices for improving outcomes for children and youth with disabilities and what schools and programs implement is part of the mission of the Research to Practice Division of the Office of Special Education Programs (OSEP) in the U.S. Department of Education. From 2005 to 2014, OSEP funded seven cohorts of model demonstration projects (MDPs), each of which focused on a single new or promising (or perhaps poorly understood or implemented) practice, procedure, or program with evidence of high potential for improving outcomes for children and youth with disabilities. From 2012 to 2014, OSEP also funded three cohorts of Stepping-Up Technology Implementation projects, which implement evidence-based technology tools and develop and disseminate products that are intended to help schools and early intervention programs effectively implement the tools. Each MDP and technology implementation grantee implements its evidence-based model or technology tool in typical settings and assesses its impacts.

In addition, from 2005 to 2015, OSEP funded the Model Demonstration Coordination Center (MDCC) at SRI International. MDCC staff members worked with the cohorts of MDP and technology implementation grantees to facilitate collaborative learning within each cohort and document implementation experiences. For some cohorts, MDCC staff members helped establish consistent design elements (e.g., sample definition, data collection methods, instrumentation) and synthesized cross-grantee data. In addition, MDCC conducted cross-grantee and cross-cohort analyses to identify factors that facilitated or hindered the implementation of the models or technology tools.

MDCC worked with 34 grantees across the 10 MDP and technology implementation cohorts, which addressed a variety of topics (see Table 1). Their interventions were delivered in a variety of settings—schools, juvenile justice facilities, early childhood education and early

Table 1. Cohorts of Model Demonstration and Technology Implementation Projects Facilitated by MDCC

Cohort 1: Progress Monitoring Interventions for Elementary School Reading (four grantees,* 2006–2009)	
Target population	Students in grades 1-4 in general education and special education classes
Core intervention components	<p>Progress monitoring interventions within a response to intervention (RtI) framework, featuring</p> <ul style="list-style-type: none"> • A measurement model (e.g., the progress monitoring data collected, frequency, who was responsible, supporting technology used) • Procedures for using progress monitoring data to track student progress, modifying instruction for students making insufficient progress, identifying students who may be eligible for special education services because of a reading disability, and developing individualized education program goals and monitoring progress toward them.
Cohort 2: Tertiary Behavior Intervention Models in Elementary and Middle Schools (four grantees,* 2007–2010)	
Target population	Elementary and middle school students with serious behavior problems who had not been responsive to primary behavioral strategies or secondary behavioral interventions
Core intervention components	<p>Tertiary interventions within a schoolwide positive behavior support framework, featuring</p> <ul style="list-style-type: none"> • Preestablished primary (tier 1) and secondary (tier 2) prevention programs • Multidisciplinary team approach • Data-driven screening process • Positive behavior support plans driven by functional behavioral assessments • Individualized tertiary behavior interventions • Progress monitoring to assess response to intervention.
Cohort 3: Early Childhood Language Interventions (four grantees,* 2008–2011)	
Target population	Children ages birth through 5 with significant language disorders or delays
Core intervention components	<p>Language interventions within the early intervention (EI) service delivery and early childhood special education service systems, featuring</p> <ul style="list-style-type: none"> • Evidence-based functional language interventions delivered in natural settings by adults who cared for or worked directly with participating children • Training and support for parents and providers/teachers in implementing evidence-based language-promoting strategies in daily activities • Use of assessments and data in guiding personalized services • Efforts to maintain continuity of the model strategies across <i>IDEA</i> Part C EI and <i>IDEA</i> Part B preschool programs.
Cohort 4: Tiered Approaches for Improving the Writing Proficiency of High School Students (two grantees, 2010–2014)	
Target population	High school students (ninth grade)
Core intervention components	<p>Tiered writing interventions, featuring</p> <ul style="list-style-type: none"> • Universal screening to assess students' writing proficiencies • Evidence-based core instruction on writing proficiencies and the application and transfer of skills across academic content areas • Use of data to monitor students' progress and make instructional and placement decisions • Interventions at different levels of intensity for students who do not make adequate progress.

* Cohort included two grantee organizations that partnered on a single grant.

Table 1. Cohorts of Model Demonstration and Technology Implementation Projects Facilitated by MDCC (concluded)

Cohort 5: Tiered Approaches for Improving Outcomes for English Learners in Primary Grades (three grantees, 2011–2015)	
Target population	Students classified as English learners (ELs) with or at risk of having a disability
Core intervention components	A tiered approach for improving reading and language outcomes featuring <ul style="list-style-type: none"> • Appropriate research-based reading instruction and interventions for ELs • Culturally responsive teaching strategies and principles • Progress monitoring and screening • Data-based decisionmaking.
Cohort 6: Assistive Technology for Young Children (three grantees, 2013–2016)	
Target population	Infant to preschool-age children with disabilities or developmental delays
Core intervention components	Assisting <i>IDEA</i> Part C EI and Part B preschool programs in implementing models that promote and sustain promising practices for the effective use of assistive technology (AT). Features include <ul style="list-style-type: none"> • Methods to develop child-specific AT plans • Methods to develop or modify local policies for reuse of AT • Methods to modify local policies and procedures to facilitate the use of AT.
Cohort 7: Reentry of Students With Disabilities From Juvenile Justice Facilities Into Education, Employment, and Community Programs (three grantees, 2013–2016)	
Target population	Youth with disabilities exiting juvenile justice facilities
Core intervention components	Models to facilitate the successful reentry of youth into education, employment, and community programs. Features include <ul style="list-style-type: none"> • Integrated transition services • Individualized aftercare including intensive educational interventions • Interagency collaboration • Monitoring youth's progress.
Cohorts 8–10: Stepping-Up Technology Implementation Projects (seven grantees, 2013–2016; four grantees, 2014–2017; three grantees, 2015–2018)	
Target population	Children and youth with or at risk of disabilities or developmental delays, age preschool to 12th grade. Specific target population of each grantee varied depending on project goals.
Core project components	Promote the effective implementation of evidence-based instructional and assistive technology tools, including <ul style="list-style-type: none"> • Resources needed to effectively implement evidence-based technology tools that benefit students with disabilities • Products that will help a broad range of schools to effectively implement these technology tools.

intervention programs, and community-based organizations—and spanned the age range from infancy through high school. This breadth of implementation experiences provided MDCC with a valuable opportunity to examine such experiences across a diverse set of interventions, settings, and populations as a basis for identifying strategies that lead to high-quality implementation, sustainment, and wider adoption of interventions. The implementation experiences of the MDP and technology implementation cohorts provide many examples of strategies grantees used to facilitate implementation across its several stages.

Further information about MDCC's work, including evaluation questions addressed, data sources and methods, and products, can be found in Appendix A. Lessons learned about the

factors that help or hinder successful implementation have been included in a variety of MDCC reports⁶ and are summarized in Appendix B.

This chapter provides an important context for understanding the lessons learned from MDP and technology implementation grantees. It describes the implementation science principles and the conceptual framework that have guided MDCC's work and provided a structure for reporting the findings generated from it.

Implementation Research and Conceptual Frameworks

As mentioned, practices found to be effective in research studies often do not translate into meaningful outcomes for the targeted populations when implemented under naturally-occurring conditions. Understanding and closing this gap between research and practice is the focus of implementation science, a rapidly growing cross-disciplinary field of inquiry. In the inaugural issue of *Implementation Science*, the editors defined implementation research as “the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice” (Eccles & Mittman, 2006, p. 1). This field draws from the work of related disciplines such as the diffusion of innovations (e.g., Rogers, 2003), translation of knowledge into practice (e.g., Rynes, Bartunek, & Daft, 2001; Shonkoff & Bales, 2011), and organizational change (e.g., Decker, Durand, Mayfield, McCormack, Skinner, & Perdue, 2012).

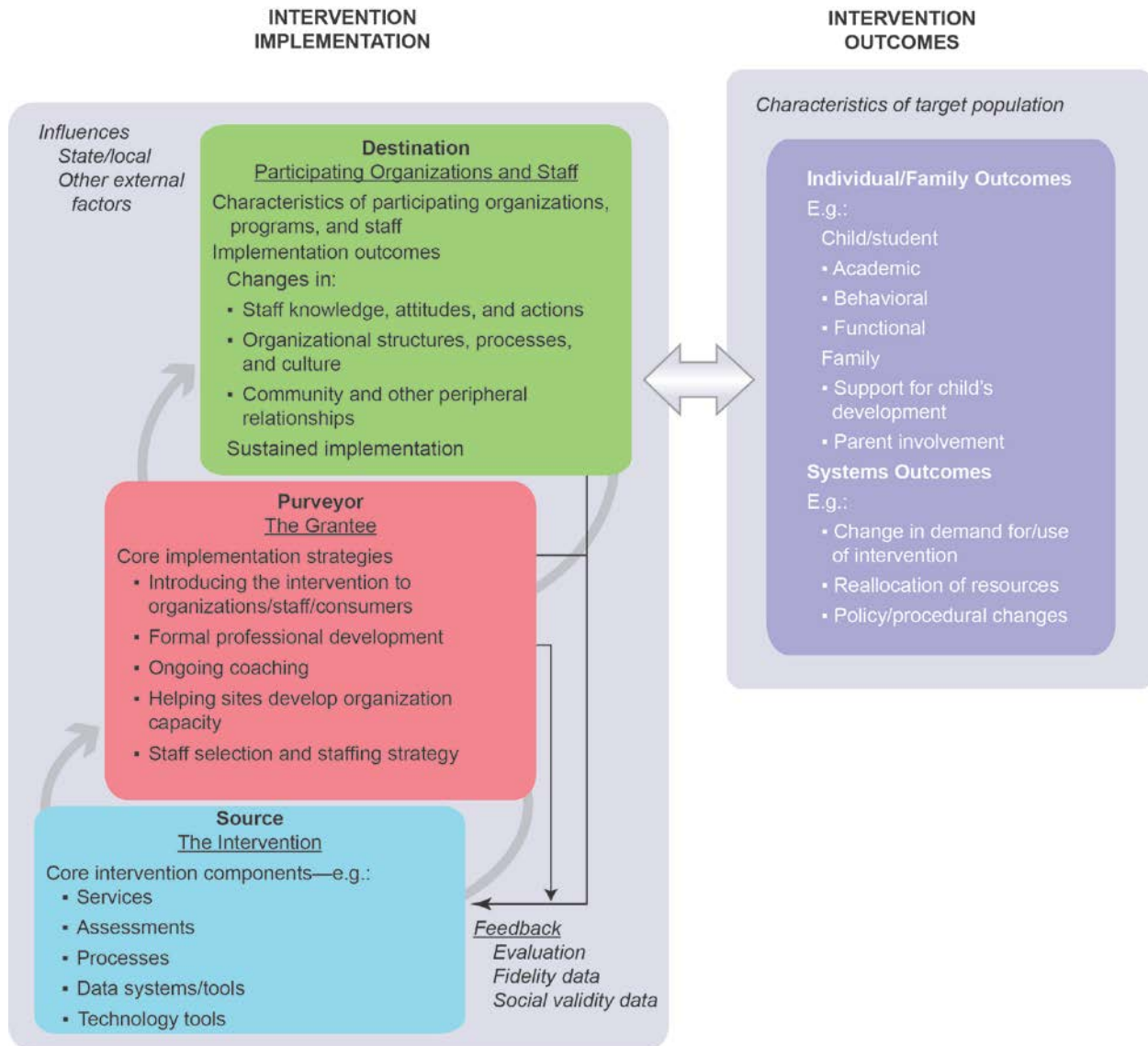
The number of conceptual frameworks for understanding the implementation process has grown significantly in the last 15 years (Nilsen, 2015). In an effort to synthesize the varying theories and frameworks in the health care sector, Damschroder and colleagues (2009) developed the Consolidated Framework for Implementation Research, which has five domains: (1) the intervention, (2) the inner setting (features of the organization such as structure and culture), (3) the outer setting (the larger social/political context in which the organization resides), (4) the individuals involved (the intended recipients of the intervention), and (5) the implementation process (the change process for getting the individuals and organizations to implement the intervention). Theories and frameworks in education and human service areas identify similar influences on the implementation process. Many of these have been incorporated into the conceptual model that guided the MDCC's work.

MDCC adapted a conceptual model for understanding the implementation of interventions that was developed by the National Implementation Research Network (NIRN) at the University of North Carolina, Chapel Hill (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005). The NIRN model specifies the key elements in the implementation process; the MDCC adaptation of this framework is summarized below and shown in Figure 1.

- **Source.** The source is the model or technology tool being implemented, which has *core intervention components*. Characteristics of an intervention (e.g., complexity, compatibility with the implementation environment) may relate to its implementation (Rogers, 2003), and its fit with the needs of the population it is intended to benefit (Chinman, Imm, & Wandersman, 2004).

⁶ MDCC reports are available at http://mdcc.sri.com/prod_serv.html.

Figure 1. MDCC Conceptual Framework



Source: Adapted from Implementation Research: A Synthesis of the Literature (Fixsen et al., 2005)

- **Purveyor.** The purveyor is the MDP or technology implementation project grantee, which is responsible for transferring the model or technology tool to participating sites through *core implementation strategies*. These core implementation strategies include procedures for putting the model into practice, including selecting sites, providing professional development (PD) and training, offering ongoing coaching and support, and choosing implementation staff (Fixsen, Blase, Naoom, & Wallace, 2009b; Proctor, Landsverk, Aarons, Chambers, Glisson, & Mittman, 2009).
- **Destination organization.** The destination organization is the site of implementation (e.g., school, early childhood program), including such aspects as its human and financial resources, social networks, leadership, and culture (Glisson, Landsverk, Schoenwald, Kelleher, Hoagwood, Mayberg, & Green, 2005). Implementing staff are

the individuals involved in implementation or supporting it and organizational factors may influence their behavior (e.g., attitudes, self-efficacy, beliefs; Bandura, 2000; Elliott & Mihalic, 2004).

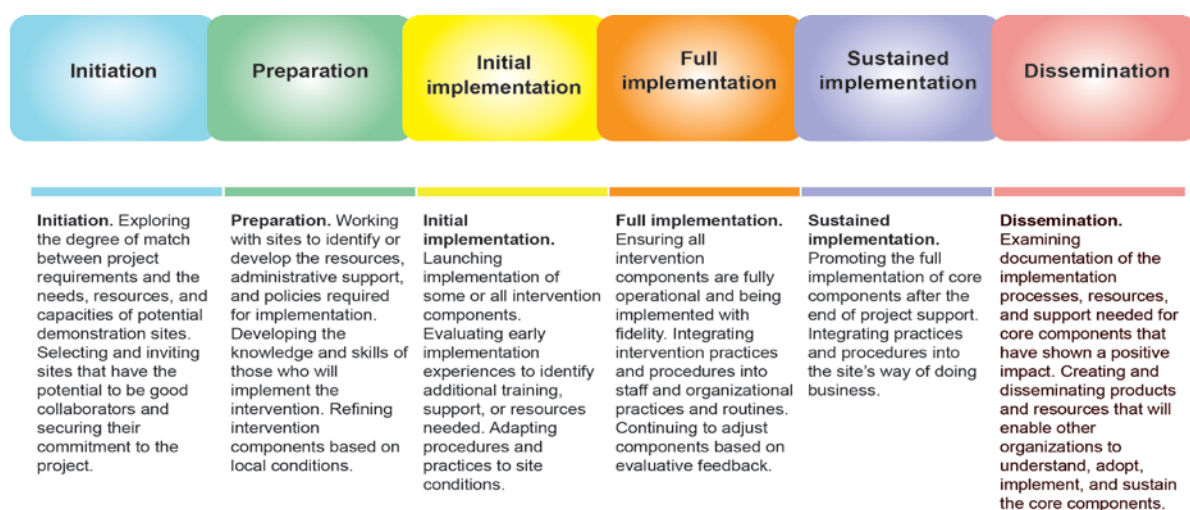
- **Influences.** External factors may influence how the destination organization and implementers respond to the MDP or technology implementation project. These may include such factors as district financial stability, the influence of unions on teachers' participation in project activities, and accountability pressures.
- **Target population.** Characteristics of the population that is expected to benefit from implementation of the model or technology tool (e.g., children, youth) may affect implementation, outcomes, or both.
- **Feedback loops.** These are the learning paths through which implementation experience informs iterations of the intervention and implementation components (Supplee & Metz, 2015).
- **Implementation outcomes.** These include three outcomes from the NIRN model: "changes in adult professional behavior (knowledge and skills of practitioners and other key staff members within an organization or system)"; "changes in organizational structures and cultures, both formal and informal (values, philosophies, ethics, policies, procedures, decisionmaking), to routinely bring about and support the changes in adult professional behavior"; and "changes in relationships to consumers, stakeholders (location and nature of engagement, inclusion, satisfaction), and systems partners" (Fixsen et al., 2005, p. 12), as well as the extent to which the destination organization maintains the core intervention components (i.e., sustainment).
- **Intervention outcomes.** Because the NIRN conceptual model concerns the implementation process and not the results of interventions, an element related to intervention outcomes (individual and systems level) was added to the MDCC conceptual framework to reflect the full intention of the MDP and technology implementation grantees. Characteristics of the models and technology tools, implementation fidelity, and factors associated with the destination organizations and their contexts may relate to variations in how effectively the components are implemented and whether desired outcomes are achieved.

Guided by the MDCC conceptual framework, MDCC collected information from grantees and synthesized findings about the influences on the implementation process. These findings form the basis of the implementation strategies and practices associated with successful implementation that are presented in this report. We begin with an examination of grantees' experiences across the various stages of implementation.

2. Stages of Implementation

Incorporating new practices, programs, or technology tools into organizational ways of doing business for sustained implementation takes time and intention and typically evolves through multiple stages, as depicted in Figure 2 (adapted from Fixsen et al., 2005). MDP and technology implementation grantees typically moved through these stages, working with host organizations to leverage or create conditions for success at each stage. The timeline and activities required for each stage varied widely, depending on, for example, the readiness of those organizations to implement the model or technology tool, the state of development and complexity of the model or tool, and the grant's funding timeline. Grantees' experiences during the different stages are described below, followed by recommended strategies for assessing readiness to advance from one stage to the next.

Figure 2. Stages of Implementation for Model Demonstration and Technology Implementation Projects



Source: Adapted from Implementation Research: A Synthesis of the Literature (Fixsen et al., 2005)

Lessons Learned at Each Implementation Stage

The following sections highlight lessons learned by grantee leaders at each stage of implementation. Further details can be found in MDCC briefs on four of the six stages: initiation (assessing sites), preparation, sustainment, and dissemination.⁷

Initiation

At the initiation stage, grantee leaders looked for and secured the commitment of sites where there was a reasonable chance of implementation success. An important goal of this stage was to *assess factors that may affect implementation*, such as the levels of administrative support

⁷ Briefs can be found at http://mdcc.sri.com/prod_serv.html.

and buy-in among implementers, the availability of needed resources, and intervention compatibility with the site, among others (Shaver, Wagner, & Lenz, 2011). Experiences across the MDP and technology implementation cohorts underscored the importance of initial site assessments for successful implementation. Some grantees pulled out of sites or had sites drop out because site personnel were unwilling or unable to implement the interventions as intended. One grantee team, for example, discovered at the end of a challenging implementation year that the teachers involved in the model had felt pressured by school administrators to participate and had never fully bought into the project. Grantee leaders believed that if they had been able to spend more time up front listening to school staff to better understand their perspectives, they could have selected a different site or worked earlier to address the challenges.

In addition to providing valuable information for site selection, initial site assessments helped grantees tailor their capacity-building activities to the strengths and needs of the selected sites. Grantees across the cohorts discovered that staff in some sites lacked the foundational skills for understanding intervention components and successfully implementing them. In these cases, grantee leaders could not proceed with components of their interventions until they helped site personnel develop the requisite skills or knowledge, such as classroom management techniques, content knowledge, or principles of child development.

Preparation

The goal of the preparation stage was to *build the capacity of the implementing organizations and systems* they worked in, as well as the individual implementers of the intervention, to optimize conditions for success. Preparatory activities can be critical to achieving high-quality implementation and, ultimately, improved outcomes for the target population. As experienced by some grantees, “Many implementation efforts fail because someone underestimated the scope or importance of preparation” (Barton & Krause, 1985, p. 103).

For MDP and technology implementation grantees, preparation involved building relationships with site personnel and stakeholders; continuing to learn about site conditions, priorities, and needs; beginning to build the competency and confidence of site personnel to implement the intervention; building the capacity of the organization to support implementation; and developing the capacity of the grantee team to effectively support the sites (Shaver & Wagner, 2013). In explaining her team’s preparation strategies, one leader observed that the effort and work required to build relationships for successful implementation can be easily overlooked, given the many activities that need to be conducted to help prepare a site for implementation.

Another important objective of the preparation stage was to continue to gather information to *assess the fit of the model or technology tool to the site*, which required listening to feedback from sites as well as communicating the requirements for successful implementation to site personnel. Grantees typically addressed any mismatches at this stage by such strategies as adding content to initial training activities and intensifying efforts to develop site leaders.

Initial Implementation

This stage marked the *launching of some or all intervention components*. MDCC defined initial implementation as occurring in the first year of implementation at a site, as many MDP and technology implementation grantees spent much of the first year refining intervention components and adjusting both intervention and implementation components to sites’ needs.

Many grantees began implementation with a main component and added other components later in the year. For example, a number of MDP grantees that focused on academic interventions within a tiered system of support launched core instructional components for the whole class (e.g., culturally and linguistically responsive core literacy instruction for classrooms with English learners) early in the school year and worked with school staff on supplemental and intensive interventions for smaller groups of students needing additional supports later in the year. In this early implementation stage, teachers and direct service providers were trying out recently acquired skills and new knowledge. Frequent assessments of their skills and confidence were important at this point, so that the supports necessary for addressing competency gaps could be identified and provided. Grantees also used this stage to refine data collection instruments and develop checklists for sites to use to monitor implementation. For instance, it was often during initial implementation that grantee staff worked with site personnel to clearly define expected practices and develop or refine fidelity tools.

Full Implementation

MDCC defined full implementation as occurring in the second and subsequent years of implementation at a site. At the full implementation stage, *all intervention components were fully operational*, and implementers were expected to achieve high levels of fidelity. With those fundamentals firmly in place, grantee leaders often turned their focus to building sites' capacity to implement the model or technology tool independently in preparation for the withdrawal of grant-funded supports (e.g., identifying and training site staff to serve as trainers and coaches). Several grantees incorporated a train-the-trainer model at this stage to transfer PD responsibilities to the sites. Although grantees reported making some adjustments to the interventions or implementation strategies, major adaptations were typically made during the first implementation year.

Sustained Implementation

Although MDP and technology implementation grantees had the initial responsibility of helping sites develop the knowledge, skills, and supports needed for implementation, they needed to transfer ownership of implementation to the sites and their larger systems in order to *create lasting and widespread change* in programs, practices, and outcomes. MDP teams in three MDCC cohorts participated in follow-up studies to examine model sustainment 1 to 2 years after the completion of their projects. Across the sites participating in the 12 projects included in these studies, 50% had fully sustained model practices at follow-up (Wagner & Shaver, 2015). For some, high-quality implementation was never attained during the grant-funded project, so sustainment could not be expected.

Grantee leaders involved in the follow-up studies identified a number of factors that they believed had facilitated sustainment:

- helping sites align intervention practices with local initiatives and priorities,
- providing sites with concrete products and materials,
- giving sites tools to demonstrate continuous results to implementers and stakeholders,
- encouraging model adaptation to address local needs and increase ownership, and
- connecting to systems-level supports where possible.

Several factors that hindered both implementation and sustainment also were noted. For instance, one school district had difficulty implementing its model with fidelity after a new superintendent launched competing initiatives. The resulting loss of district commitment and support for the model derailed implementation during the MDP. Even when implementation went well, some grantee leaders reported significant obstacles to sustainment, such as staff turnover and budget cuts. The ability of some grantees to achieve sustained implementation, despite some of these obstacles, demonstrates that effective implementation strategies can lead to sustained practice.

Dissemination

A primary goal of OSEP's Research to Practice Division is to *facilitate the transfer of knowledge about evidence-based practices* from research and demonstration projects to the individuals and organizations working directly with children and youth. OSEP has explicitly addressed this goal in the request for applications (RFA) for MDPs with the requirement that grantees "initiate a process for carefully documenting the model's practice components, implementation processes, and implementation tools and guides sufficient to allow for replication of the model" (e.g., Office of Special Education and Rehabilitative Services, 2012a, p. 32955) if evidence supports its benefits to children or youth with disabilities. Grantees also have been expected to "develop a high-quality dissemination plan that reaches broad audiences including regular educators, special educators, related service providers, administrators, families, policymakers, and researchers" (Office of Special Education Programs, 2009, p. 33421). RFAs for the Stepping-Up Technology Implementation projects required that applicants plan to select 10 dissemination schools or programs "to extend the benefits of the technology tool to additional students" (Office of Special Education and Rehabilitative Services, 2012b, p. 29989).

To support replication of their intervention or technology tool by others, grantees were expected to provide enough information to interested organizations for them to determine (1) whether the model or tool had the potential to address a pertinent need, (2) what was involved in adopting it (e.g., resources required and processes for implementing it with fidelity), and (3) whether, once implemented, it would produce the intended benefits (Shaver, Lenz, Wagner, & Greene, 2015). Thinking about dissemination and replication early in the development and demonstration process helped grantees identify the elements that needed to be clearly defined to enable successful adoption by others.

Assessing Readiness to Advance to the Next Implementation Stage

Understanding when a site is ready to move from one stage to the next is important for implementation success because going through the stages prematurely can increase expenses, reduce efficiency, and create resistance to change among site-level implementers (Fixsen, Blase, Horner, & Sugai, 2009a). This can be avoided when grantees develop and apply criteria, processes, and measures to assess the readiness of their implementation efforts to move from one stage to the next. Researchers have provided support for this kind of readiness assessment by identifying several methods for collecting useful data, such as doing document analyses, administering questionnaires and surveys to implementers, conducting focus groups, observing practitioner behaviors, and analyzing user data (Marshall & Rossman, 2011; Merriam & Bierema, 2014; Mowbray, Holter, Teague, & Bybee, 2003). Table 2 provides example criteria for determining whether a site is ready to move from each stage of implementation to the next

Table 2. Example Criteria and Data Collection Methods for Assessing Readiness to Move From One Implementation Stage to the Next

Criteria	Example Data Collection Methods
Moving From Initiation to Preparation Stage	
<p>Do site personnel exhibit:</p> <ul style="list-style-type: none"> Knowledge of the evidence supporting the effectiveness of the intervention? An understanding of how the intervention would fit with other initiatives and priorities (e.g., local and state priorities)? An understanding of how infrastructure and organizational practices at all levels need to change to facilitate the intervention? An understanding of the PD, coaching, meetings, and other activities that might be required for all implementers? A strong commitment to investing the requisite time and resources to this vision and to the success of the initiative? 	<ul style="list-style-type: none"> Focus groups and interviews that establish site staff members' level of knowledge of the evidence guiding the program Initiative inventory in which decisionmakers list all existing initiatives and rate the current level of resource commitment Survey that assesses level of understanding of changes needed across all organizational domains (e.g., changes in instruction, changes in staff assignment, changes in school schedule) Attitudes and beliefs survey that assesses implementers' attitudes regarding benefits, credibility, and feasibility of the intervention
Moving From Preparation to Initial Implementation	
<p>Are the following in place:</p> <ul style="list-style-type: none"> A clear understanding of intervention components? Trained implementers who exhibit the needed knowledge, skills, and confidence to begin implementation? Staffing and plans for ongoing professional development and coaching? Resources, leadership, and administrative supports required for implementation and how these might change over time? Procedures for performance assessment and recognition of implementing staff? Data collection and analysis procedures to track fidelity and social validity of the new practices? Mechanisms for responding to implementation challenges and making adjustments? 	<ul style="list-style-type: none"> Implementation checklist that measures extent to which implementers have selected an implementation team, created a meeting schedule, and identified training resources needed Survey administered before and after PD seminars that measures implementer understanding and areas of growth regarding intervention components and requirements Checklist or document review of all procedures related to performance assessment, data collection and analysis, and implementation problem-solving protocols Attitudes and beliefs survey or focus group interview assessing the level of buy-in for the intervention among staff
Moving From Initial Implementation to Full Implementation	
<p>Are the following in place:</p> <ul style="list-style-type: none"> Qualified, trained staff for all implementation roles? Professional development and coaching plans, schedules, and accountability procedures? Procedures for performance assessment and recognition of implementing staff? Data collection, analysis, and reporting procedures to track fidelity, social validity, outcomes? Policies and procedures to support the new way of work? Communication mechanisms that use evaluation information and transmit this information to funders and other stakeholders for decisionmaking? 	<ul style="list-style-type: none"> Knowledge test that measures implementers' understanding of intervention and resources required Document review of PD planning and coaching schedule, workbooks, training agendas, participants Survey to measure implementers' acceptance of the model or tool (social validity) Checklist of all policies and procedures for implementation, performance assessment, data collection, analysis, and reporting Communication feedback map that identifies and monitors pathways of communication among implementers and between implementers and program developers

Table 2. Example Criteria and Data Collection Methods for Assessing Readiness to Move From One Implementation Stage to the Next (concluded)

Criteria	Example Data Collection Methods
Moving From Full Implementation to Sustainment	
<p>Have the following been achieved:</p> <ul style="list-style-type: none"> • High fidelity among implementers? • Improved/Improving outcomes (e.g., higher test scores, fewer discipline referrals, improved language acquisition)? <p>When the supports and resources of the grant are withdrawn, will the implementing organization have the capacity to</p> <ul style="list-style-type: none"> • Continue delivering the intervention to the targeted population? • Provide the infrastructure and supports necessary, including PD? • Incorporate intervention practices and procedures into business as usual, including assessing fidelity? 	<ul style="list-style-type: none"> • Observation rubric that measures frequency and fidelity of implementation across all layers of organization • Performance assessment results that indicate improved/improving outcomes • Survey that measures frequency of intervention practices and levels of support from leadership as well as implementers' attitudes regarding benefits, credibility, and feasibility of intervention • Document review of all new policies and practices at implementation site
Moving From Sustainment to Dissemination	
<p>Are the following in place to support dissemination and replication:</p> <ul style="list-style-type: none"> • Program information about the intervention, how it works (e.g., the need it addresses, the theory and evidence behind it), and resources and supports necessary for implementation? • Clear documentation of the features of the intervention, including the core intervention components? • Identification of the professional development, resources, infrastructure, and other supports necessary for implementation? • Tools for assessing progress (e.g., measures of fidelity, social acceptance, and outcomes)? 	<ul style="list-style-type: none"> • Dissemination plan including materials, tasks, parties responsible, intended audience, and proposed timeline • Document review of all publications, research, and materials available to support replication of the intervention, including user manuals, professional development materials, and related training resources • Inventory of all assessment and data collection materials, including performance assessments, surveys, checklists, protocols, and interview guides

and offers example data collection methods for assessing readiness; Appendix C provides links to example readiness measurement tools.

Although different assessment methods are appropriate for different implementation stages, two important considerations for assessing readiness are relevant at all stages. First, *multiple kinds and sources of data should be considered* in deciding whether implementation efforts are ready to progress to the next stage (Gansle & Noell, 2007), and, second, the *standards for determining an acceptable level of performance on each readiness assessment measure should be determined* before data are collected.

For example, to assess whether teachers were ready for initial implementation of a new reading program, grantees leaders could administer a survey following initial PD sessions to determine whether teachers had acquired the knowledge of program practices, as well as the confidence and buy-in necessary to implement the new practices. Measures of skills mastery through observations of teachers demonstrating the practices could supplement survey data.

Grantee leaders would need to identify acceptable levels of skills mastery, confidence, and buy-in as measured by both methods to determine whether teachers were ready to begin implementation (e.g., a threshold score of 70% on a skills mastery composite score). These data sources could also help inform grantee staff about the effectiveness of PD sessions and suggest any new content or different methods that might be needed to better help teachers reach the levels of readiness and willingness to adopt the program that are needed for successful implementation.

Readiness instruments often are specific to a particular implementation stage. To assess readiness to move from the **initiation** to the **preparation** stage, grantees could *consider ways to measure administrator and practitioner buy-in* for the new program, practice, or tool and other critical implementation factors, such as the intervention fit, resource availability, and capacity to implement (e.g., NIRN's Hexagon Tool).⁸ A more informal assessment approach was reported by several technology grantees that used feedback from focus groups to gauge staff buy-in for their projects.

Readiness to transition to the **initial implementation** stage is indicated when data from multiple sources show that *all resources, infrastructure, training, and supports required for an intervention are in place* (Shaver et al., 2015). One technology implementation project grantee administered a survey and observed classrooms to determine practitioner technology usage and identify the need for additional PD before initial implementation. Another technology implementation project grantee administered an online knowledge and performance test to practitioners after completion of PD modules to assess the effectiveness of the modules in establishing the needed practitioner knowledge and skills.

In **full implementation**, the emphasis is on *achieving high fidelity and consistency of implementation* as a foundation for achieving improved outcomes. To assess readiness to move to this stage, grantees could use a developer-created checklist indicating the presence or absence of each of the procedures related to core intervention components. For example, NIRN provides the checklist, *Stage-Related Activities for Initial Implementation* (see Appendix A), to assist developers and implementers in determining the strength of initial implementation and readiness to move on to full implementation. An assessment of implementers' acceptance of the model or tool is also important at this stage.

Once it has demonstrated fidelity and improved outcomes in full implementation, the organization is ready to move to the **sustainment** stage. Assessing readiness for this stage is most informative when it involves all stakeholders and determines the extent to which at each level the support and resources needed for successful sustainment are present (Fagen & Flay, 2006). Any gaps identified in that assessment can then be addressed before the grantee exits the implementation site(s). Although several cohorts of grantees had not reached the sustainment stage, in planning ahead for it one technology implementation grantee identified several factors that would likely affect program sustainment, including strong leadership support, motivated teachers, availability of resources, and alignment of the intervention with school and district priorities. To acquire this kind of information, grantees could use checklists of resources and policies needed to support sustainment, surveys and interviews that evaluate stakeholders' perceptions, and an observation rubric that measures implementation frequency and fidelity. With

⁸ <http://implementation.fpg.unc.edu/resources/activity-4-3-exploring-hexagon-tool>

that knowledge, the grantee team could shape its implementation strategies to support development of those factors.

Finally, grantees can consider assessing readiness for **dissemination** of their intervention to potential users. This stage involves having the ability to *provide materials* that clearly identify the target population and detail the resources and supports necessary to implement the model or tool successfully and independently of the grantee. Grantees would need to consider an appropriate format for dissemination, create a dissemination plan, and choose ways and measures to evaluate dissemination results (Shaver et al., 2015). Important components are user manuals, PD and coaching plans, and a timeline for dissemination.

Assessing readiness to move between implementation stages can help prevent implementation challenges. Grantee leaders shared examples of the consequences of proceeding to the next implementation stage before sites were ready. For example, one MDP team discovered after initial implementation that a site's teachers had not mastered the instructional content and skills to implement its model. The team members realized that they could have mitigated teachers' frustrations and loss of confidence by helping them build skills before being expected to implement the model on their own, even after receiving PD.

Further information about how evaluative feedback can help improve implementation is presented in Chapter 6. In the next three chapters, we present lessons learned from grantees about developing and refining core intervention components, strategies for building sites' organizational capacities to support implementation, and strategies for developing competency among site personnel for successfully delivering the model or technology tool to the target population.

3. Developing Core Intervention Components for Successful Implementation

The conceptual model that guided MDCC's work (see Figure 1) depicts the intervention being implemented as the primary driver in the implementation process. The complexity of the core components of the intervention, their compatibility with the environment in which they are being implemented, and the benefits they confer relative to the existing or alternative programs can powerfully influence implementation success and sustainment (Rogers, 2003). In this chapter, we share lessons learned about the intervention development and refinement process, as well as the intervention features that grantees found helped lead to high-quality and sustained implementation. We begin with a description of how MDPs and technology implementation projects are defined, in terms of required intervention components and development processes.

Requirements of MDPs and Technology Implementation Projects

The requirements that OSEP sets forth for MDPs and technology implementation projects regarding core intervention components and how they should be developed and refined are summarized below.

Model Demonstration Projects

OSEP defines a model as “a set of evidence-based practices within a defined implementation strategy that will improve child or system outcomes.” Model demonstration projects are intended to do the following:

- identify a set of intervention practices and an implementation strategy,
- implement the model in multiple sites,
- evaluate implementation,
- refine the model based on evaluative feedback,
- evaluate the model's impact on child or systems outcomes, and
- produce procedures and materials for model sustainment, replication, and dissemination.

These requirements are specified in the RFA to which potential grantees apply. In addition, for each MDP cohort, OSEP specifies a target population (e.g., young children with or at risk of a disability or developmental delay), as well as the intervention components that must be in the model. For example, for the cohort providing interventions for youth reentering the community from juvenile justice facilities, grantees were required to have models that had (1) integrated transition services, (2) individualized aftercare including intensive educational interventions, (3) interagency collaboration, and (4) monitoring of youths' progress. The three funded grantees included these and sometimes additional functions in their projects, though their specific features were unique to each project.

Thus, MDP grantees began with a set of guidelines that set expectations for selecting or refining a model with certain core elements that had previously been implemented and tested, together or separately. MDP grantees were expected to refine the components and strategies for model implementation based on evaluative feedback.

Technology Implementation Projects

OSEP intends for technology implementation projects funded through the Stepping-Up Technology Implementation program to promote the effective implementation of evidence-based instructional and assistive technology tools and requires them to

- identify resources needed to effectively implement evidence-based technology tools that benefit students with disabilities (preschool through 12th grade) and
- develop and disseminate products that will help a broad range of schools effectively implement these technology tools (Office of Special Education and Rehabilitative Services, 2012b).

Unlike for MDPs, for technology implementation projects OSEP does not specify a target population, need or problem, or core intervention components, resulting in projects varying widely in the nature of the tool and the need they address. Examples include teacher tool kits for PD, an online instructional system to help teachers use progress monitoring data to improve mathematics instruction, a mobile braille application to improve braille literacy, and web-based curricula to improve literacy, college and career readiness, reading comprehension for science content and online research skills.

The process for developing and refining core components is more specified for technology implementation projects than MDPs. Successful applicants are to go through three phases:

- iterative development of the technology tool and related products in three development schools in years 1 and 2,
- trial and refinement in four pilot schools in years 3 and 4, and
- if the projects are extended for a fifth year, dissemination to 10 schools as a final test of the effectiveness of the tool and products in sites that receive minimal project support.

Defining Core Intervention Components

To achieve successful implementation in demonstration sites and replicate the intervention and its effects, the most essential components must be sufficiently “teachable, learnable, doable, and [able to] be readily assessed in practice” (National Implementation Research Network, 2015). Yet the core components are often not clearly defined. Reviews of evidence-based programs and practices suggest that very few have sufficient documentation of the model components, practices, and activities that are essential for producing positive outcomes (Blase & Fixsen, 2013; Dane & Schneider, 1998). This absence of clear definitions of the core components can be a significant hindrance to high-quality and sustained implementation (Hall & Hord, 2011; Michie, Fixsen, Grimshaw, & Eccles, 2009).

MDP and technology implementation project grantees began with intervention components and development processes, prescribed to greater or lesser degrees by OSEP, and proceeded in selected sites to test, revise, and refine the models and technology tools to improve their effectiveness, feasibility, and acceptance. Although they began their projects with some evidence-based intervention components, a number of grantees spent much of their first implementation year working with sites to develop and define certain components, and many took longer to incorporate defined components into written documents. Example documents included fidelity instruments, intervention checklists (listing core components), and practice guides.

Some grantees began implementation with components that they considered to be core but determined later that they were not essential. For example, data-based decisionmaking teams began as a core component of MDPs focused on tiered writing interventions for high school students. Because this component proved to be difficult to implement in all the schools involved, MDP personnel shifted their attention from data team meetings to improving the ability of individual teachers to understand and use data for instruction. Upon reflection, these grantee leaders reported that the teacher collaboration fostered in the data team meetings was valuable but not essential to improving writing instruction or students' writing proficiency.

Challenges in defining core components may stem in part from the nature of the research on which the intervention's evidence is based. Many interventions are evaluated as a package, so developers often do not know which specific components are essential for producing the expected outcomes (Harn, Parisi, & Stoolmiller, 2013). Michie and colleagues concluded, "If effective interventions to change behaviours are to be delivered to influence outcomes at population, community, organizational or individual levels, the field must produce greater clarity about the functional components of those interventions" (Michie et al., 2009, p. 1).

MDPs and technology implementation projects enable intervention developers to increase their understanding of the components that are most important for improving outcomes but that also are feasible in multiple real-world settings. Even with strong evidence on individual components, implementation research suggests that identifying core intervention components can require multiple replications of an intervention in environments other than the one or ones in which it was developed and first tested (Winter & Szulanski, 2001; Wolf, Kirigin, Fixsen, Blase, & Braukmann, 1995). Therefore, ongoing attention to understanding and defining the core intervention components of their interventions may be required as grantee staff work in their sites.

"Experience with large-scale implementation of evidence-based interventions has forced the recognition that intervention strategies for achieving core features may vary across settings."

—Horner, Blitz, & Ross, 2014, p. 4

One tension that is ever present in the implementation of evidence-based practices or tools is the acceptable level of adaptation. If the core components of an intervention that has been previously validated are replaced with new practices, then serious questions arise about the efficacy of the intervention and whether the MDP or technology implementation project has devolved into an earlier-stage development project. On the other hand, education and early intervention systems operate in highly contextual, unique, dynamic environments that are often inhospitable to rigidly defined interventions (Dearing, 2008). Striking the appropriate balance between achieving fidelity on prescribed intervention features and allowing sites to adapt features to local needs and circumstances is among the greatest challenges for researchers and others looking to develop or adopt interventions with a rigorous evidence base that also are relevant and acceptable to potential users.

The MDPs and technology implementation projects approached this challenge in a variety of ways, although almost all acknowledged that some flexibility was required to engage site personnel in high-quality and sustained implementation. Specifically, the adaptability of intervention components was cited as an important contributor to sustainment (Wagner &

Shaver, 2015). Finally, a few grantees focused on co-creating intervention components, asking site personnel to take a normative, research-based framework and work with grantee staff to develop site-specific approaches. Co-creation helps engage stakeholders in “implementing, improving, and sustaining the use of research evidence to improve outcomes” (Metz, 2015, p. 1). Determining which of these approaches might help decide the perplexing question of fidelity versus flexibility of core components was beyond the scope of the grantees’ and MDCC’s work.

Refining Core Intervention Components

Grantees’ approaches to revising and refining core intervention components depended in part on the model or technology tool’s stage of development at the beginning of their projects. The MDPs and technology implementation projects varied in how well defined the interventions were upon grant award, with the range spanning:

- all components were well defined; tested as a model or technology tool package,
- all components were well defined; not combined and tested as a model or technology tool package,
- some, but not all components were defined; not combined and tested as a model or technology tool package.

Grantees with relatively well-defined models and technology tools were able to begin initial implementation relatively quickly and focus on generally minor refinements in response to evaluative feedback. Other grantees spent much of the first implementation year working with site personnel to construct and revise the model or tool. One MDP team focused on literacy instruction for English learners spent most of its first year developing and refining model features related to culturally responsive literacy instruction, beginning with research-based principles and adding specificity and examples based on their work with school personnel.

Like MDPs, technology implementation projects began their work with sites at various stages of development; however, they all refined their technology and associated products on the basis of feedback from early users. For example, one technology implementation project team used feedback from its initial schools to add features to make the tool more user friendly by reducing the number of steps to execute specific functions. After piloting the revised tool and obtaining further feedback, project personnel streamlined training and data entry to support sustainment. In a later round of iterative development, they increased the amount of technology support materials and modified their user manual to provide more detailed, explicit instructions for teachers.

The refinement process for both MDPs and technology implementation projects often continued throughout the life of the projects as grantee staff incorporated feedback and responded to local needs. For instance, to respond to teachers’ concerns well into implementation, one project team brainstormed ways to make team meetings less time consuming. Another project with a progress monitoring intervention encouraged a school with a large Spanish-speaking population to add Spanish screening probes for assessing progress in reading and incorporating the new probes into reporting formats. These are just a few examples of how grantees applied what they learned from implementation experiences to improve intervention components.

Best Practices for Core Intervention Components

The experiences of the MDPs and technology implementation projects involved with MDCC suggest a number of implications for designing models and technology tools that maximize the likelihood of adoption, high-quality implementation, and sustainment. Lessons learned about core intervention components are presented here.

Assess Contextual Fit

As Rogers (2003) noted, an innovative approach requires substantial compatibility with the implementing organization if it is to be fully adopted and implemented with fidelity. Horner and colleagues observed, “Although certain interventions might appear to ‘fit’ on paper, practitioners must have a certain level of motivation, interest, and support for intervention fit to be present” (Horner, Blitz, & Ross, 2014, p. 1). The authors suggested eight components of contextual fit:

- The need the intervention meets is important to those implementing it.
- Core features are defined with sufficient precision that implementers understand what is entailed in implementation.
- The intervention is evidence based, that is, supported by rigorous research.
- The intervention is practical (in terms of time, personnel and resources).
- How implementers will acquire requisite skills and competencies (e.g., training, coaching) is clearly articulated.
- The intervention is consistent with the values and preferences of those in the local organization.
- Implementing organizations have the ability and willingness to devote the resources necessary for implementation.
- The intervention is consistent with the values and preferences of those making administrative decisions.

As these factors suggest, compatibility is a function of both the intervention’s features and the nature of the implementing organization. Therefore, grantees have the responsibility to both design interventions that are effective, practical, and acceptable and select sites where personnel believe they need and value the model or technology tool and have the resources to support it.

Assessing contextual fit begins with site selection but continues during implementation to address gaps in fit with participating sites. Grantees can address mismatches by either helping sites build capacity, confidence and motivation to reach successful implementation or adapting the model or technology tool to address local realities. Every MDP and technology implementation project encountered and addressed contextual mismatches in some way. For example, upon discovering that site personnel lacked experience with educational technologies, several technology implementation projects added PD sessions and coaching to help teachers develop the requisite confidence and skills.

Allow Adaptation to Improve Contextual Fit

Researchers, developers, and implementers agree that although evidence-based interventions must have clearly defined core components that are based on evidence, they also need to have some flexibility to adapt to real-world situations. Many MDP and technology

implementation grantees acknowledged that allowing adaptations was important for building buy-in and the potential for model sustainment by addressing the needs and priorities of individual sites. For instance, one team observed that buy-in was much higher at its first implementing school, which they believed was because of that school's involvement in developing the model and aligning it with its needs. Another MDP entered its schools with a well-developed model, but it encouraged some adaptations to help school staff "own" the model. As one grantee leader stated, "We need to be flexible and see this as innovation and be able to step back." Even without intending such variations, implementing organizations are likely to adapt some core intervention components of the original model.

Not all adaptations were welcomed by grantees, however. Leaders of a technology implementation project reflected that most of the schools they worked with had adopted an all-inclusion model for the majority of their students with special needs, a model that did not work well for the project's intervention. The principal investigator commented,

"If the model is a closed system that can't adapt, then it won't work or last in many places as is."

—An MDP leader

We know through the data we have collected so far most of these students are more than two grade levels below where they should be. While we believe that these students would benefit from 30 minutes of [pull-out] explicit small-group instruction at their individual instructional level by a qualified special education teacher or reading specialist every day to make the most growth in reading performance, we unfortunately will have to respect the schools' [inclusion] model.

Consider Intervention Complexity and Burden

The literature on diffusion of innovation suggests that "simple programs are easier to explain, easier to sell, and easier to manage" (Elias, Zins, Graczyk, & Weissberg, 2003, p. 309). MDP and technology implementation grantees' experiences suggested that intervention complexity did not necessarily impede quality or sustained implementation, although there were a few exceptions. For example, a technology implementation project faced challenges when it introduced a new technology and new instructional strategies that teachers viewed as complex. Grantee leaders said they needed to increase on-site support to help teachers implement the technology and identify less cumbersome instructional strategies for both teachers and students.

Similarly, the complexity of teaming structures was reported to create significant administrative and logistical barriers for one MDP focused on tertiary interventions for children with serious behavioral challenges. Another MDP in the same cohort, however, also had complex teaming arrangements that reportedly did not result in implementation challenges. The principal investigator of the latter MDP believed that several implementation strategies helped the project overcome challenges of complexity. First, this project depicted its teaming structure in a graphic that clearly displayed the specific roles and relationships between each team. This graphic became a staple of every meeting and training session to reiterate the teaming features. In addition, multiple teams meant multiple opportunities to reeducate staff, providing "booster sessions" that increased the understanding of the model.

In post-implementation follow-up studies for three cohorts, there was little evidence that intervention complexity impeded model sustainment (Wagner & Shaver, 2015). These findings

suggest that although complexity of core components may hamper implementation in some cases, challenges can be effectively addressed by strong implementation strategies.

Help Sites Align Intervention Components With Local Priorities

Consistent with the diffusion-of-innovation literature, grantees found that practices that were aligned with the major initiatives and priorities of an implementing site were more likely to be perceived as advantageous by site personnel and therefore more likely to be adopted and sustained (Rogers, 2003). For instance, MDPs featuring progress monitoring in elementary reading instruction found that their models aligned well with national, state, and local efforts to improve reading achievement soon after the *No Child Left Behind Act of 2002* launched the Reading First Program. This strong alignment may help explain the very high model sustainment observed at original sites when the MDP teams went back 2 years after grant completion (Wagner, Lenz, & Shaver, 2011).

MDP and technology implementation project leaders found that they sometimes needed to be proactive in helping site personnel see how the model or technology tool goals and practices could address local priorities; understanding this alignment helped counterbalance a tendency for sites to shift to new initiatives. Many grantees looked for alignment at the site selection stage by avoiding sites with competing initiatives and values and selecting those where the intervention fit in naturally with relevant needs. One technology implementation project leader, for example, reflected that the technology tool was directed to improving instruction in a content area that was a priority at the school, which had a “population that would greatly benefit from an intensive instructional intervention.”

Even beyond the site selection stage, grantee leaders often had to continue aligning models or technology tools with local priorities. A district administrator working with an MDP commented on the work that had been done with the MDP staff to integrate model practices into larger organizational improvement efforts: “The model became a road map—general education changed drastically as to how they do their curriculum, how they do tiered interventions, how we use programs monitoring, and that allowed special education to change also.” Leaders of a technology implementation project reported that they made sure to align the PD on the technology tool with the district’s current curriculum and resources. The principal investigator commented, “They were very happy that we would be supplementing their current districts’ curriculums and not be offering a completely different one, which the districts were not too pleased to do.” Several technology implementation project leaders reported rewriting curricula to better align with Common Core State Standards (CCSS). The leader of one of those projects indicated that teachers’ strong support for the technology tool was due to their ability to see how the tool connected to CCSS.

The experience of one MDP illustrates the challenges that can emerge when new initiatives compete with the project for resources and attention. In this case, the model lost momentum, visibility, and support when a new superintendent brought in a number of major initiatives. MDP leaders were not successful in reengaging personnel at this site.

Support Data-Based Decisionmaking as a Core Component

The use of data for instructional and programmatic decisionmaking increasingly has been part of the national discourse on educational reform (Spillane, 2012), particularly for addressing

the diverse needs of students with disabilities (Deno, 2003). The use of data can help focus instruction and learning on students' needs (Honig & Coburn, 2008) and has been found to enhance the effectiveness of school improvement teams (Chrispeels, Brown, & Castillo, 2000). Data-based decisionmaking was a requirement of most of the MDP cohorts and was a feature of many of the technology implementation projects. For example,

several MDP cohorts implemented interventions within a multitiered system of support in which progress monitoring was an important component. Among the technology implementation projects, the use of progress monitoring data to help teachers make instructional decisions was a primary feature of a technology-based coaching system. In another project, a system of iPad apps was developed that provided detailed reporting for students, families, and teachers, enabling them to monitor progress and helping teachers determine how to effectively scaffold instruction.

Despite the prominence of data-based decisionmaking in policy and funding requirements, research has found that leaders, teachers, and service providers often do not have the skills, experience, or support to effectively use data to improve instruction or service delivery (Ingram, Seashore Lewis, & Schroeder, 2004; Stringfield, Reynolds, & Schaffer, 2001). Although some grantees were successful, a number experienced challenges with this intervention component.

In their proposals and early PD efforts, grantees were clearer about how to produce data and the kinds of changes in instruction or service delivery that should result from data than they were about the processes for using data in decisionmaking. For many grantees, delineation of the data-use process evolved over time. Their experiences suggest that it may be beneficial to define the data-use process at the outset and to develop tools and devote PD resources to supporting the use of data in addition to training in measurement procedures and interventions.

Share Results with Implementers and Other Stakeholders

Researchers have recognized that the odds of reaching high-quality implementation and sustainment of an intervention can be increased if implementers see positive results relatively quickly (Feldstein & Glasgow, 2008; Santangelo, 2009; Shediak-Rizkallah & Bone, 1998). The impact of positive results was evident across the cohorts. One MDP developed a graphing tool that depicted a child's communication and language progress, as revealed in progress monitoring data, and showed the frequency of parents' use of implementation strategies. These data were shared with each family throughout its participation in the project and were reported to be "powerful" for parents, who were "elated" to see how much their children were attempting to communicate. Continuous demonstration of results also was found to be a strong facilitator of model sustainment among the MDPs involved in post-implementation follow-up studies. For instance, a school administrator noted that as a result of seeing students' reading achievement improve, "Our administration, faculty, and even our students have a completely different mindset about reading instruction and learning to read than we did 5 years ago."

Grantee leaders also reported positive effects of sharing results with stakeholders. For example, the leadership of a participating district reportedly was willing to add schools to a technology implementation project after seeing the positive results of the first school's involvement. Another MDP leader indicated that seeing students' improved scores on writing assessments motivated a district to continue supporting the writing model and expand it to all

"Sharing data at all levels—with the parents, at the provider level—was the most important part of the project."

—An MDP leader

secondary schools in the district. Another MDP reported that district personnel used data at school board meetings as evidence of the positive impact of the intervention on its schools, eventually enabling it to receive additional funding.

Sometimes sharing results included data on social validity or testimonies of implementing personnel. A technology implementation project leader, for instance, noted that when project-affiliated teachers spoke about their successful implementation experiences, additional teachers became interested in using the project's tool kit in their instruction.

Data on a model's impacts can be powerful. Nonetheless, collecting child-level data initially can be viewed as a burden for implementers. It often takes time for even a very effective intervention's impacts to be demonstrated with performance data, even when the instruments being used are sensitive to change. It is important to the implementation process that grantees ensure that data are available to demonstrate change as early in the project as feasible. For instance, one MDP reported that early data demonstrating the social validity and positive outcomes of its behavior intervention stimulated enthusiasm and more widespread implementation within participating school districts.

Provide Concrete Tools and Resources

Concrete directions, resources, and usable tools can foster confidence and competence among site personnel, aid in training new staff, and facilitate replication of the model or technology tool. Numerous grantees reported that PD participants were often overwhelmed with model or technology tool-related content and had difficulty translating information and strategies into practice. Those project leaders reported becoming proactive in developing tools to help implementers overcome these difficulties. For example, an MDP team created templates for instructional planning and checklists of essential model practices and received appreciative responses from participating teachers. Teachers in another MDP's site struggled to differentiate instruction for students with varying needs. In this case, project staff developed enrichment materials for students who did not need supplemental instruction so the teachers could devote attention to those who needed that instruction.

These are just a few examples of the variety of resources and products grantees developed to support and engage site personnel in using the model or technology tool. User manuals for practitioners were a common resource developed by grantees, while some grantees developed guidebooks documenting principles of best practices. An MDP focused on literacy instruction for English learners created a guidebook for teachers outlining principles and examples of culturally responsive instruction. A few grantees produced materials for parents, such as DVDs demonstrating ways they could support their children's learning. MDP and technology implementation projects also provided sites with tools to assess progress and outcomes such as fidelity checklists, progress monitoring measures, student surveys, observation protocols and instruments, and outcome measures. These materials not only facilitated implementation, but also could be used in training new staff to sustain the intervention.

Choose Cost-Effective and Flexible Tools for Diverse Users and Purposes

Many grantees, both technology implementation projects and MDPs, incorporated electronic tools in some form (e.g., web-based progress-monitoring programs, online curricula, mobile apps). Some grantees planned to use these tools in a similar way across their

implementation contexts (e.g., in all schools, with all teachers or parents). These grantee teams learned, however, that they needed to customize both their selection of technologies and how they were used because the technologies were more available in some contexts (e.g., in urban vs. rural communities) and more appropriate for some purposes than others (e.g., for assessments rather than task management). Additionally, grantees often contributed the technology tools or covered their costs for participating organizations as part of their projects. A heavy reliance on costly or proprietary technologies can be a limiting factor in the expansion of a model beyond the original implementation sites. Some grantees intentionally selected publicly available tools, some of which were free, to support the sustainment of the model or technology tool.

Tools that offer flexible design elements often can better address the diverse needs of users. For example, a technology implementation project developed an online curriculum with a flexible learning system where teachers could choose how to incorporate the tool into their instructional approaches. Teachers could select a flipped classroom model where students were assigned to watch video instructional modules at home and receive targeted instruction by the teacher at school. Another technology implementation project grantee built in flexible components to prepare for spread beyond the state where the project was based. The principal investigator commented,

While we are developing this tool in [state name], our goal is to create a tool that could be not only sustained here, but can be replicated in other states. We aligned all of our project activities with the National Common Core College and Career Readiness standards so that the lessons and activities could be plugged into any middle school curriculum. We have used principles of universal design in each of our lessons so that the tool can be used in many different settings with students with varying disabilities in hopes that its flexibility and responsiveness will facilitate broad usage and sustain effort at future implementation.

Determine Costs and Resources Required

Feasible interventions are those that can be implemented within the resource constraints of real-world settings such as schools and early intervention programs. For some cohorts, grantees were required to “Collect formative data on...estimates of the cost of implementing the model, including costs of various components of the model” (Office of Special Education Programs, 2011, p. 50466). In a time of limited resources and growing budget constraints, decisionmakers need complete information about the relationship between costs and associated outcomes of services and interventions (Hummel-Rossi & Ashdown, 2002; National Comprehensive Center for Teacher Quality, 2010; White, Albers, DePerna, Elliott, Kratochwill, & Roach, 2005).

Researchers recommend using one of several approaches to cost analyses to determine which intervention programs most closely meet the needs and budgets of interested consumers (National Comprehensive Center for Teacher Quality, 2010). Cost-effectiveness and cost-benefit analyses are two of many ways to calculate the costs of a model or technology tool. Cost-effectiveness analyzes which of two alternatives provides the lower cost per given level of effectiveness (Levin & McEwan, 2001). Cost-benefit analysis is similar but is used only when both resources and output measures are measured monetarily (Hummel-Rossi & Ashdown, 2002). Cellini and Kee (2010) provided steps for cost-effectiveness or cost-benefit analysis, which include defining the goal of the intervention, analyzing resource costs and benefits (including annualized costs and benefits over time), quantifying or monetizing benefits, and then

computing a ratio or a dollar value (Cellini & Kee, 2010). Similarly, The National Comprehensive Center for Teacher Quality (2010) provided eight action steps for schools and districts engaging specifically in cost-effectiveness analyses, including defining the scope of the intervention, analyzing resource costs (including costs over time), identifying possible alternatives, and estimating the effects of the program.

A few grantees, particularly those in cohorts where it was required, estimated model or technology tool costs. For example, one grantee working with youth exiting juvenile justice facilities estimated the costs of providing transition services by determining how many transition coordinators were needed to work with all eligible youth, assuming each coordinator had the recommended maximum case load of 30 juveniles, and estimating the annual costs of those workers. Another grantee tracked the hours grantee staff spent in schools across four types of tasks (primary tasks, secondary tasks, related tasks, and miscellaneous tasks) to estimate the costs of various PD and coaching activities to support implementation.

Regardless of the method, it is important for grantees to fully disclose resources necessary to implement and sustain their intervention. Conducting cost-benefit or cost-effectiveness analyses, however, was not common among MDP or technology implementation project grantees. Grantees that were trying to have existing staff within the sites take responsibility for implementing the intervention found it especially difficult to estimate the true costs of implementing their model or technology tools. Grantees did agree, however, that implementing sites needed to meet the resource requirements for successful implementation, and several cited examples where sites pulled out because these requirements could not be met.

Even without conducting thorough cost analyses, providing basic resource information such as the number and type staff needed, PD requirements, necessary technology costs, and all other resources needed will help sites successfully implement and sustain the intervention and also help other sites consider model or technology tool adoption.

High-quality implementation, sustainment, and scale-up of evidence-based practices require clearly defined core intervention components that are proven to be effective, feasible, useful, and cost-effective. Grantees can use the implementation strategies described in the next two chapters to help organizations and their staffs develop the capacity to successfully implement evidence-based interventions.

4. Facilitating Implementation: Building Staff Capacity

Within the field of implementation science, attention has focused on building practitioners' capacity because it is these individuals—teachers, behavior specialists, early intervention service providers—who act as the “delivery mechanisms” for interventions (Han & Weiss, 2005; Supplee & Metz, 2015). As Fixsen and colleagues (2009) pointed out, the purpose of the implementation process is to enable practitioners to use the selected intervention routinely and effectively. For this to occur, however, practitioners must be trained to use the intervention in their classrooms, schools, districts, and early intervention settings (Bandy, Bowie, Burkhauser, & Metz, 2008; Bierman, Sanford DeRousie, Heinrichs, Domitrovich, Greenberg, & Gill, 2013; Greenberg et al., 2005). Research on successfully implemented programs has identified several core implementation strategies or drivers related to successfully developing staff capacity, including practitioner selection, PD (preservice and inservice training), and ongoing coaching and consultation (Fixsen et al., 2009b). To varying degrees, the MDPs and technology implementation projects built these core strategies into their implementation processes for their models and technology tools. Strategies related to PD (preservice and inservice training, typically delivered to groups of participants) are presented first, followed by strategies for supporting implementation through coaching (“just-in-time” individualized support to practitioners). The chapter concludes with strategies for selecting and preparing project personnel (i.e., those working for the grantee to support implementation at the sites).

Professional Development as an Implementation Tool

It has long been recognized that well-designed PD in human service professions is essential to improving client outcomes. Through PD, new knowledge, techniques, and innovations reach service providers and become part of their daily practice (Poplin, 2003; Webster-Wright, 2009). In education, well-designed PD helps those responsible for implementing policy changes do so effectively (Desimone, Smith, & Frisvold, 2007), improves practitioners' skills and competencies by facilitating the timely and effective dissemination of evidence-based practices (Guskey & Yoon, 2009), and promises to foster positive educational outcomes for all students (Lauer, Snow, Martin-Glenn, Van Buhler, Stoutemyer, & Snow-Renner, 2005; Yoon, Duncan, Lee, Scarloss, & Shapley, 2007).

Guskey (2003) suggested that there can be no “one size fits all” approach to designing effective PD. Rather, it must be designed, implemented, and evaluated to meet the needs of practitioners in particular contexts and settings. Decisions about what PD approach to adopt need to consider the intended outcomes (Levine & Broude, 1989) and should be based on the principles of adult learning (e.g., Knowles, 1998; Merriam & Caffarella, 1999). Adult learning opportunities need to be relevant and applicable to learners' experiences, should provide time for them to contemplate the impact of the learning on their experiences and responsibilities, and lead to personal growth as they become self-directed and autonomous (Englert & Tarrant, 1995; Knight, 2007).

Several grantee leaders explicitly stated that their PD opportunities were based on the principles of adult learning. For example, one technology implementation project leader reported that the PD models used were based on the Learning Forward Standards for Adult PD from the

National Staff Development Council,⁹ and several MDP teams cited the PALS: Participatory Adult Learning Strategy (Dunst & Trivette, 2009). Another grantee leader based the PD strategies used in that project on the Concerns Based Adoption Model.¹⁰

At its core, PD is about practitioners learning how to learn, learning new content and pedagogies, and transforming their knowledge into practice for the benefit of those they serve. Professional learning is a complex cognitive and emotional process, requiring practitioners to reflect on their convictions and beliefs, honestly examine their current professional practice, and have the capacity and willingness to adopt new practices in place of their existing ones (Darling-Hammond & McLaughlin, 1995). Research on PD demonstrates a growing consensus regarding some of the components that are critical to expanding practitioner knowledge and skills, including providing PD of sufficient duration, focusing on specific content and strategies, and encouraging active involvement of participants (Birman, Desimone, Porter, & Garet, 2000; Desimone, 2009; Joyce & Showers, 2002). Against this backdrop, lessons learned from grantees' experiences and strategies for PD are presented here.

Provide Professional Development of Sufficient Duration

Research indicates that deep changes in practitioner knowledge, skills, and behaviors are likely to take considerable time but has not identified a precise duration (e.g., Boyd, Banilower, Pasley, & Weiss, 2003; Corcoran, McVay, & Riordan, 2003). There is some research support for the effectiveness of learning opportunities that include an intense summer institute with short follow-up sessions. Other research suggests that PD should include at least 20 hours of contact time according to Desimone (2009) or even 30 or more contact hours (Guskey & Yoon, 2009).

MDPs and technology implementation projects generally provided PD that was consistent with these research-based features. School-based projects typically offered initial training (often summer institutes) lasting 2 to 4 days, as well as follow-up PD sessions during the school year to reinforce knowledge and skills, supplement the content covered in the summer, or add content based on implementation experiences. For instance, one technology implementation project team provided 3 of days of PD early in the school year and then supplemented it with PD via video conferencing over the course of the school year. Other MDPs and technology implementation projects provided substantial ongoing PD; for example, one grantee held PD sessions biweekly from August through June.

Align Professional Development With Practitioner Knowledge and Beliefs

PD is likely to have more impact when it is consistent with practitioners' beliefs, knowledge, and expectations (Darling-Hammond & Richardson, 2009; Desimone, 2009; Lauer et al., 2005). An adult's readiness to learn is influenced by the degree to which the activities reflect and honor the value that he or she brings to the learning experiences (Graner, Ault, Mellard, & Gingerich, 2012). Additionally, learning experiences that are grounded in the participant's content area or that enhance information or skills linked to job performance can increase motivation to learn.

Some grantees were intentional in using activities that incorporated personal perspectives, background knowledge, and skills to help participants become more willing to engage in learning

⁹ See <http://learningforward.org/standards#.Vd-D0Zf9zhk>.

¹⁰ See <http://www.sedl.org/cbam/>.

(e.g., critical reflections, real-life situations). One reported strategy was to ask participants to reflect on and share how implementation of the model or technology tool might affect them personally.

Many grantee teams reported that determining the training needs of site personnel was an important function of preparatory activities. Some grantees had well-developed PD strategies going into their sites, whereas others had a more flexible approach. Nonetheless, grantees agreed that it was important to have an understanding of their PD participants and to adapt to meet their needs. Indeed, most grantees found they needed to revise or refine training content or format based on their observations of gaps in requisite skills or input from site personnel.

The leaders of one technology implementation project, for example, assumed that teachers would have the science background necessary to implement their online units. They soon realized that this was not always the case and added training content and supplemental materials to address the knowledge gaps. Another MDP team reported benefitting from spending many hours in the spring listening to site personnel and getting their input on PD needs and goals for the coming fall. Grantee staff continued to use information collected from site personnel to revise the curriculum each year to meet site personnel's needs. The staff also adjusted the length, timing, and instructional methods to respond to local feedback (e.g., participants wanted more time to practice skills). Another way to address participants' needs was to make adjustments during PD sessions, as one grantee leader explained: "If during an [instructional activity] the group would like to detour to a topic of interest to the group, [the MDP team] will collaborate to make the opportunity possible." By involving site personnel in identifying training topics, MDP leaders sought to connect training to their experiences and beliefs and to increase engagement in training and model implementation.

Infuse Professional Development With Active Learning

To be effective, PD should actively involve practitioners (Banilower & Shimkus, 2004; Bransford, Brown, & Cocking, 2004; Ross & Bruce, 2007; Thoms, 2001). Active learning for participants, as opposed to passive learning that occurs during lectures and presentations, can include leading discussions, practicing with technology, role-playing, reviewing videos of past performance, or reviewing student work and assessment scores (Loucks-Horsley, Love, & Stiles, 1998; Parsons, Rollyson, & Reid, 2012). This involvement enables practitioners to rethink their own practice, try out new roles in a safe environment, engage in individual and collective reflection, and develop confidence to integrate the new knowledge or skill into their daily practice (Darling-Hammond & McLaughlin, 1995). One team had instructors and learners alternate roles as trainer and trainee to fully engage participants. Those serving in the trainer role led an explicit process for introducing concepts, facilitating application, helping participants reflect, and providing feedback.

"A key ingredient...is active learning involvement in all phases of the learning process."

—An MDP leader

As a way to engage teachers in a summer institute, leaders of a tiered writing intervention MDP had them participate in the same writer's workshop activities that they would be using with their students, including writing in response to a prompt, self-editing, peer editing, and group

reflections on the process. Several MDP leaders pointed to the importance of engaging training participants in self-reflection, stating that when participants can consider challenges and create their own solutions, they deepen and sustain their understanding of the new practices.

Engaging practitioners in active learning was particularly important as technology implementation projects introduced their tools to practitioners. These projects provided practitioners with PD on academic content, instructional strategies, and how to use the technology tool embedded in their project. One project leader explained that the first 2 days of PD consisted of both students and teachers learning the technology and the specific instructional strategies with the support of a trainer. On the third day, teachers spent the morning incorporating the technology and strategies into their classes, with the trainer available to offer assistance. Most technology implementation projects delivered PD at the site and reported introducing practitioners to the technology tool, modeling how to use it, and giving practitioners plenty of time to practice using it. One principal investigator reflected, “Teachers explored the technology tool, we showed a video to model it, teachers used the tool to write a persuasive essay paragraph, and then we discussed the tool and the instructional prompts.”

Facilitate Collective Participation of Practitioners

Another critical feature of effective PD is collective participation of practitioners (e.g., Borko, 2004; Corcoran et al., 2003). Facilitating groups of practitioners in sharing and critically interrogating their practices in an ongoing, reflective, learning-oriented, and growth-promoting way enhances learning (Stoll, Bolam, McMahon, Wallace, & Thomas, 2006; Vescio, Ross, & Adams, 2008). Community-building activities, group reflections, involving participants in role-plays, and collaborative problem-solving activities were among the strategies grantees used to help participants learn from each other. Leaders of several grantees also reported that the best way to engage site personnel was to involve them in designing and implementing the training. One of these leaders explained:

A hallmark of the [our] approach is a priority on *we* rather than *I* and on facilitation of collective group process and outcomes all the while that we are supporting growth in individual knowledge and skills. We intend to catalyze the operation of communities of practice by which the model demonstration sites will co-develop the PD plan. Features of the PD that will be co-developed include delivery methods, evaluation, schedule, and in some instances selection of instructors.

Supplement Distance Learning With Individual Support

To expand their reach and reduce training costs, a number of grantees developed online training sessions and supports. This was a particularly important for grantees that covered a wide geographic area or worked with remote sites. Most grantees that incorporated distance learning into their projects used a hybrid approach, with online training as a supplement to on-site training to reinforce content or to orient new staff. One grantee, for example, developed short how-to videos and screen shots as supplements to training, whereas another developed videos of teachers modeling practices that could be accessed online. In these cases, the online content went hand in hand with grantees’ on-site trainings.

Several grantees, however, relied heavily on online training vehicles, and their experiences suggested it is important to provide opportunities for active learner participation in virtual

training environments. For example, one MDP team accompanied its on-site work with early intervention program staffs with an online course. These MDP leaders believed that the course helped the project disseminate core model-related strategies; however, they concluded that it was important to pair online content with individualized feedback to help participants accurately apply what they learned in the course. As the MDP principal investigator stated, “In keeping with recommended practices for PD and adult learning, online experiences like [course name] should be sustained, have multiple opportunities and modalities of feedback, and should encourage a provider’s reflection on their practice.” Although this grantee provided some individualized support for online training participants, leaders stated that in the future they would use social media and other technologies to create forums for collaborative problem solving. Leaders of many grantees developed or intended to develop online training options to help spread their models or technology tools; therefore, understanding the efficacy of various approaches to distance learning may become increasingly important.

Assess Learning

An important PD strategy is evaluating participants’ knowledge and skills to assess mastery or progress toward mastery. MDPs and technology implementation projects assessed learning derived from PD activities in a variety of ways. For most grantees, participant self-assessments and informal feedback by the instructor or other participants were strategies used during initial PD. Formal assessments of site staff members’ mastery of intervention-related skills usually occurred later during coaching visits or instructional or service delivery observations. These data were reported to be important indicators to grantees of areas in which PD successfully led to mastery of necessary content and skills and areas in which additional support was needed.

One technology implementation project was an exception in that it assessed learning during the delivery of its 12 online instructional modules. The online system featured embedded formative assessments, and teachers had to take a knowledge test based on the units’ content to move from one level to the next. Teachers also had to pass a set of performance indicators before they could have access to the technology tool. If they did not pass, they had opportunities and supports to relearn the content and reach the mastery level. Teachers who did not reach mastery on the second attempt were not given access to the tool.

Align Professional Development With Existing Site Goals and Policies

As with the core intervention components, aligning PD activities with local goals and priorities is important. Several grantees discovered that PD overload was a challenge at some of the participating sites or that project-related PD conflicted with other PD in content or timing. In these cases, grantee leaders worked to help sites see how project-related PD could help them address local priorities and needs. Some grantees also had to be flexible with the timing and format of their PD to align it with training that was already planned.

Coaching as an Implementation Tool

One of the major shifts in understanding what constitutes effective professional learning has been the realization that initial PD must be accompanied by ongoing coaching (e.g., Cornett & Knight, 2009; Fixsen et al., 2005; Joyce & Showers, 2002; Raver, Jones, Li-Grinning, Metzger, Champion, & Sardin, 2008). Learning a new strategy and becoming adept at using it

independently take time and patience (Bandy et al., 2008). Coaching supports behavior change by helping practitioners overcome common barriers to implementing new instructional strategies or behaviors. Coaches can support novice users by providing encouragement and perspective if the new practice does not swiftly lead to the outcomes expected. Practitioners who are learning a new strategy may initially feel awkward in applying it. Coaches can help practitioners fine-tune their use of the new practice so that it becomes a natural part of their instruction.

Effective coaching builds knowledge, skills, and buy-in because it can impact participants on multiple levels, such as the intellect, practices, and beliefs (Aguilar, 2013). It also can create a caring and respectful relationship through which the practitioner is able to absorb and implement the new knowledge and skills imparted during PD sessions (Lloyd & Bangser, 2009). Building on that knowledge and the support of learning with peers, participants can take the risk of changing their practices in an environment in which their growth is recognized and celebrated (Sheridan, Pope-Edwards, Marvin, & Knoche, 2009). The experiences of MDP and technology implementation grantees suggest the strategies presented here for coaching support.

Use Coaching to Provide Encouragement and Support

Demonstrating respect for site personnel as professionals was a common theme of the coaching MDPs and technology implementation projects provided. Grantee leaders reported that setting a tone of mutual respect helped break down barriers with practitioners. The staff of one MDP made it clear to teachers that they were not coming in to judge what the teachers were doing but to help them reflect on their practice. Several MDPs used one-on-one coaching to listen to the concerns of those involved in model implementation, help resolve problems, and gain their trust in hopes of increasing their buy-in, commitment, and confidence in implementing the model.

MDPs and technology implementation projects provided practitioners with support and encouragement. One technology implementation project leader explained that coaches helped practitioners to use the technology tool, create student-level reports, and locate the resources, lessons, and activities based on assessment of student performance “to help each student fill in the gaps of the reading skills that are most difficult for them at the time of the assessment.” The principal investigator reflected that “Many of the teachers seemed to appreciate that there was someone there to always help them when needed.” The leader of another technology implementation project reported that coaches provided encouragement and additional instruction to practitioners who did not pass the project’s online assessment after completing the PD modules.

“Our coaches developed good rapport with the teachers and thanked the principal for allowing them in their schools.”

—An MDP leader

Use Coaching to Address Practitioner Needs

Some MDP and technology implementation project teams discovered that they could not proceed with implementing some components of the model or technology tool until they developed practitioners’ foundational skills and knowledge. One grantee leader noted that practitioners were teaching one skill for the majority of their instructional time instead of integrating several skills at once, were teaching the whole group instead of differentiating instruction, and tolerated low student engagement and participation. The principal investigator said that coaches worked with practitioners on all those elements of effective teaching. For

technology implementation projects, the issue of practitioner skill was further complicated by the technology component. Practitioners differed in their attitude toward the role of technology in the classroom and in their comfort with using the technology tools. One technology implementation project team planned to help teachers develop competency in using the technology tool; however, when team leaders discovered that teachers had not mastered the behavioral intervention model that the tool was meant to support, coaching was adjusted to integrate support for understanding the technology as well as the intervention model. A number of grantee leaders highlighted the importance of providing “just-in-time” coaching to immediately address requests for support from practitioners and administrators.

Provide Opportunities for Self-Reflection through Coaching

The personal relationships built through coaching can help increase participants’ willingness and confidence to evaluate their own practice. Several grantees used self-reflection activities as a key strategy for increasing implementers’ capacity to deliver the interventions. One grantee, for example, created a structured process for weekly teacher observations, which included self-reflection questions posed by the coach to the teacher, followed by the coach’s affirmation of strengths exhibited, as well as areas for growth. Coaches reported that teachers became more comfortable with the self reflection and insightful about their own practice over time. Another grantee team reported that having teachers video record themselves delivering model-related practices and reflecting on their practices by reviewing the recording was one of the project’s most powerful strategies for changing teachers’ attitudes and behaviors. Many teachers were said to be initially hesitant to watch themselves teaching, but when they did, their awareness of areas for growth increased dramatically, as did their willingness to try new approaches, according to the project principal investigator.

Deliver Coaching Through Multiple Means

Some technology implementation projects adopted innovative approaches to coaching. Several reported that they provided support, curriculum consultation, and technology troubleshooting via e-mail and telephone. Another technology implementation project leader explained how coaching was provided “virtually” to one group of practitioners who uploaded videos of themselves teaching lessons. The coaches watched the videos, coded teacher behaviors, and scheduled a meeting to go over the strengths of the lesson, as well as to give suggestions on how best to prepare for future lessons. The grantee leader went on to explain that to provide further support, coaches uploaded videos of themselves modeling instructional routines and strategies and alerted the teachers who could benefit from them to watch when they had the time. This leader added, “Coaches will also be able to hold ‘webinar-type’ meetings with teachers of similar needs to have discussions online between the coach and the teachers.”

Another technology implementation project team adopted a blended approach that used face-to-face and online coaching. The principal investigator explained that the team had established a biweekly or weekly face-to-face coaching meeting with the teachers and then developed an online content management tool. This leader explained:

The online management tool offers the teachers asynchronous professional development opportunities. Embedded into the online tool are a wiki and discussion forum that we plan to use with teachers weekly. We also have the

ability to provide for synchronous learning through Adobe Connect, which may become essential given that some of our teachers cannot meet at the same times each week after school due to personal obligations.

Testing the effectiveness of different coaching approaches was the central focus of one technology implementation project. This project's purpose was to examine the impacts on reading instruction and student reading achievement of three coaching models: technology-based coaching, on-site coaching, and on-demand coaching. The technology-based approach used a unified system that allowed a coach and a team of teachers to collaborate and support one another as a professional community from a distance via desktop teleconferencing. If this approach is found to be effective, it may provide model and technology implementation grantees with a more cost-effective vehicle for providing site personnel with ongoing coaching.

The Role of Selecting and Supporting Project Personnel in Implementation

Knowledgeable grantee leaders are in the ideal position to clearly describe their intervention, predict possible roadblocks, and proactively suggest solutions (Fixsen et al., 2005; Schofield, 2004). MDPs and technology implementation projects play an important role in the development of the competency drivers described in implementation science literature (Fixsen et al., 2005; Halle, Metz, & Martinez-Beck, 2013). They are responsible for building their implementation team, including assembling the right staff, providing training, and developing communication and oversight structures. Strategies that grantees found to be helpful in selecting and supporting project staff are described below.

Build Relationships Among Team Members

In addition to building relationships with site personnel, some projects were intentional about building relationships among their own staff members. Several projects emphasized that gaining an understanding of team members' skills was an important part of preparing for implementation. One grantee leader explained, "We needed to know the skills that each team member brought to the project. We had to begin building communication and trust and relationships within the team." The leader of another project pointed out that team-building was especially critical for projects that involved team members from different organizations. In one case, two institutions co-led an MDP. Grantee leaders from the two institutions established mechanisms for frequent communication between the two teams as a way to integrate their strengths and perspectives into a unified approach toward facilitating model implementation. However, not all MDPs and technology implementation project teams were as intentional about building their own teams. A number of projects were staffed by people who had worked on similar projects together and did not feel they needed further preparation as a team. These grantees reported benefiting from the collective expertise, experience, and teamwork developed from these prior collaborations.

Match Project Staff Skills to Implementation Demands

Most MDPs and technology implementation projects paid careful attention to building teams with the knowledge, skills, and experience necessary to implement the model intervention or technology tool. MDP and technology implementation project leaders reported selecting project staff on the basis of their educational background, expertise in the model or technology content area (e.g., functional assessment and behavior interventions), and experience working in

educational settings. Many reported that their staff members were master's- and doctoral-level graduate research assistants (GRAs) who were qualified in special education and specific content areas. One team, for example, had five doctoral-level GRAs who were the main change agents going into the sites to deliver the intervention. As the grantee leader explained,

It was very important for us to find highly qualified GRAs with extensive teaching experience. All five have master's degrees in special education as well as teaching experience working specifically with students with high-incidence disabilities before joining a Ph.D. program.

Several technology implementation project leaders reported selecting staff with technology and graphic design experience, especially if their technology tool was web based or app based. Leaders of one such project explained that they looked for project members with multiple skills:

An additional criterion for our staff was skill overlap with another of our broad project areas. For example, our media production specialist has experience producing video in educational settings and working with teachers and interventionists. Our software engineers have experience and interest in teacher education, special education, and usability of data collection programs.

Staff for Sustainability

An important consideration is the impact staffing choices will have on the sustainment of the model or technology tool. Several MDPs hired and trained their own staff to deliver the intervention to the target population (e.g., children, youth, parents). A primary objective of these MDPs was often to test whether individual model components that research had demonstrated could improve outcomes could be integrated and made to work effectively in real-world settings. These projects typically achieved high levels of fidelity but offered little opportunity for practitioners from the host sites to learn and master model practices. Findings from follow-up studies of three MDP cohorts indicated that rates of model sustainment at original sites were very low for MDPs that had employed their own staff to deliver the intervention (Wagner & Shaver, 2015). When staff positions are provided or paid for by the grantee, it may be unrealistic to expect sustained practices when the grant ends.

Provide Professional Development for Project Staff

Some but not all grantees provided training and on-the-job opportunities for their project staff. One project leader explained that before entering schools, project staff received training about behavior support and functional assessment in education settings, the role of special education in providing support in general education settings, models of schoolwide positive behavior support, and the basic use of the tool technology. Another technology implementation project team adopted a "learning-by-doing" approach to staff development. Project staff members were responsible for developing different components of the project (e.g., technology prototype, lesson plans) based on their knowledge and areas of interest. Their work was reviewed and discussed weekly, resulting in iterative refinements. The leader of this team said, "We hope this learning-by-doing approach provides not only natural learning opportunities, but also the feeling of ownership by our staff." Several MDPs and technology implementation projects provided training on using the instruments developed to assess students and to track fidelity of

implementation and impact. For example, a technology implementation project team received training on all measures, and the reliability of each member's data was checked. The project leader added, "Team members will repeat the reliability check again prior to post-testing since many months will have passed between the pre- and post-test assessments."

Develop Communication and Oversight Structures

Grantees reported developing communication and oversight structures for their project teams. A number of grantees, for example, reported holding regularly scheduled meetings with staff to discuss all aspects of the project. Many project leaders received routine updates from the implementation team via e-mail as well as during regular conference calls. Several technology implementation projects used technology tools for ongoing monitoring and tracking of practitioner use data, which were shared with project staff, pointing out the need for additional supports for practitioners who were not making sufficient progress in their use of the tool.

In addition to these many lessons regarding building the capacity of implementing staff, MDP and technology implementation project grantees also gleaned valuable insights regarding the strategies for building capacity at the organizational level, as described in the next chapter.

5. Facilitating Implementation: Organizational Capacity Building

The end users of the interventions that MDP and technology implementation grantees develop and seek to implement most often are individuals such as teachers, behavior specialists, and early intervention service providers. Most of them work in organizations—schools, districts, early intervention settings—whose structures, procedures, values, and culture significantly influence their actions. The implementation experiences of multiple cohorts of grantees and a growing body of research on facilitating organizational change suggest several themes for moving organizations toward full implementation of evidence-based interventions. These include establishing strong partnerships with implementing organizations and developing and adapting concrete strategies for creating change.

Establish Effective Organizational Partnerships

In their account of implementation experiences with multiple whole-school educational interventions, Glennan and colleagues (2004) affirmed that “the process of design and demonstration is necessarily interactive, involving the developers, teachers, schools, and districts in relationships that continue over time” (p. 650). Most MDP and technology implementation project leaders have understood the importance of building and nurturing relationships with stakeholders in their implementation sites. As one MDP principal investigator stated, “Relationships are key” in building a foundation of trust between members of the grantee team and site personnel. For some grantees, this foundation had already been established through prior collaborations. Grantee staff working in new sites had to begin at the ground level to build trust. Regardless of the history with their sites, grantee leaders used such intentional relationship-building strategies as emphasizing collaboration between grantee and site staff, developing relationships with both those directly involved in model implementation and organizational leaders, frequently being present on site, and being flexible.

Emphasize Collaboration

Essential to creating strong partnerships is supporting the growth of a collaborative culture that harnesses the best of all participants in the shared work of implementation. In developing relationships with site personnel, some MDP and technology implementation project leaders underscored the importance of presenting the project as an opportunity to collaboratively develop and validate promising practices that may later have broad benefits for children and youth. Building relationships requires demonstrating respect for the skills, experience, and perspectives of site personnel, according to grantee leaders. One leader explained that her team members worked deliberately to set a tone of mutual respect and collaboration with site personnel from their earliest contacts through full implementation. Similarly, the leader of another project stated, “Soliciting the teachers’ input, feedback, and ideas from the planning phase onward is critical to building capacity and sustaining the model.”

“One of the powerful things we do as observers is that we really do observe—we don’t judge. We don’t go in as if we were the experts and tell them what to do.”

—An MDP leader

Articulating its approach to establishing partnerships with sites, another grantee team emphasized its “transparent and collaborative process.”

This kind of collaboration acknowledges the reality of working in natural settings, where grantees must depend on individuals within the settings to accept, commit to, and engage in high-quality implementation for the grantee to reach its goals. “Collaborative practices help the participants feel ownership of the content and appear to make them more motivated to continue to use the approach beyond the end of the PD experience,” remarked a grantee staff member, while another leader posited that a collaborative approach gives participants a stake in the intervention. A member of another grantee team noted that developing a collaborative relationship takes skill and intentionality but when done well creates the conditions necessary for strong partnerships and supportive implementation environments.

Develop Relationships at Both Leadership and Operational Levels

Successful grantees recognized the importance of building partnerships with site staff at multiple levels. The principal investigator of one MDP that had finished its work observed that garnering the support of district leaders early on was an important contributor to successful and sustained implementation in several sites. Developing these early relationships increased the project’s visibility and made it easier to align the project with other high-priority local initiatives. Another grantee leader reported:

We realized the importance of the leadership at the school. The principal can really make things happen through reinforcing goals and action plans for accomplishing project goals. The principals also really have knowledge of the staff needs, issues, and challenges with the process and are able to express that to project staff in a cohesive manner.

A different grantee leader observed that nurturing relationships with “natural leaders” among those who would be implementing the model also was beneficial. She stated, “When others see them [peer leaders] beginning to implement and being enthusiastic, they will see that it can be done.”

Be On Site Often

Conducting site visits was frequently identified as a valuable way to develop relationships and understand conditions at the sites. In addition to grantee staff members providing information about their model and answering questions, a number of grantee leaders described listening to the concerns and interests of site personnel as a very important relationship-building strategy. One leader reported that “interviewing people and just talking to them about their professional lives as teachers” helped the grantee team develop a rapport with them. Her team members asked such questions as, “What do you like about your job?” “What are the difficulties?” and “What are your hopes and fears regarding participating in a project like this?” Members of another grantee team attended school events such as open houses, parent meetings, and school competitions “to be a presence and provide support” as they worked on building relationships within the schools. The ability of a grantee team to make frequent visits to a site is, of course, influenced by the geographic distribution of sites relative to the grantee’s location. Although many grantees chose sites in proximity to their institutions, others ranged farther to find sites that represented the variety they sought or that met their selection criteria. Traveling to a distant site often influenced implementation decisions (e.g., concentrating PD in a 4-day visit

to a site rather than providing multiple sessions of shorter durations). In fact, leaders of one grantee reported that

Being present in the schools, given their busy schedules, was one of our biggest challenges. It has been hard to clear a whole day or two to drive there and back (2+ hours one way plus inclement weather), but we realized that being present in the schools is essential and we need to get more creative about building relationships virtually.

Be Flexible

Although many grantee teams went into their implementation sites with a clear specification of both the core intervention components of their models (e.g., curriculum, tiered system of supports, progress monitoring data system) and the core implementation strategies (e.g., PD content and schedule), they also recognized the need to have some degree of flexibility in fitting those components to the conditions at a given site. For one grantee, the level of flexibility required was unexpected.

We were surprised at how different the needs of the schools were from the very beginning. It was a reminder to us of the need to really tailor our PD and be responsive to their needs. We originally designed our PD as a one-size-fits-all approach and quickly realized that was not the best approach. We also needed to think of the schools more as partners in defining the issues and problems rather than just stepping in with what we wanted to accomplish.

Other grantee leaders asserted, “We have to be willing to constantly meet them where they are.” In one site, capacities and needs were accommodated through a collaborative process whereby practitioners and grantee leaders jointly developed and modified the intervention to address the needs of children and their families. An MDP leader stated, “We flexed and adapted to them” as part of the relationship-building process. However, this level of flexibility was not advocated by all grantee leaders; some spoke of the need to balance their listening and adapting to the organization with staying true to the vision of the grantee team, suggesting that “We need to co-construct the model but with the critical components the project leaders believe are important.”

“While we have a model in place, it can’t be rigidly administered. It has to be open to what they [site personnel] say their needs are.”

—An MDP leader

Strategies for Building Organizational Capacity

With the foundation of a strong partnership, grantees can implement concrete strategies for helping sites develop the supports, infrastructures, and resources required for successful MDP or technology implementation project implementation. Building organizational capacity to fully staff, operate, and sustain the intervention or tool is critical for successful and sustained implementation. Grantees’ experiences suggest several lessons for site capacity building.

Thoroughly Assess Sites' Readiness for Implementation

Understanding the importance of contextual fit (Horner et al., 2014) can be critical to a successful implementation partnership. One of the early important tasks of MDPs and technology implementation projects was identifying sites where there was a reasonable chance of success. As grantees selected and prepared sites, they had an opportunity to evaluate the presence or absence of conditions that were optimal for successful implementation and remove from consideration partners that did not meet minimum thresholds of capacity. Grantees differed in their philosophies about how ready sites needed to be for MDP or technology implementation project participation, with some grantee teams selecting only sites with environments that were highly conducive to implementation success and others selecting sites with challenging conditions. A careful readiness assessment can identify existing challenges and be a basis for strategizing how to minimize their impact.

A key component of a readiness assessment is gauging the fit between the fundamental components and principles of the model or technology tool and the values, culture, and processes at a site. Incompatibility of the organization and the model or tool (e.g., a direct instruction approach to reading being implemented in a school that embraces a whole-language approach) can present potentially insurmountable obstacles to implementation. Grantee teams found it helpful to articulate the minimum set of factors or conditions that needed to be in place for them to accomplish their goals and looked for that fit among potential partners. One project leader described that team's assessment approach and its value to their work:

We devised a list of essential characteristics consistent with our philosophy and practice patterns. These included a commitment to inclusive programming, an orientation toward families as partners, and a reputation for innovation/ entrepreneurship.... We initiated conversations with individuals at the [appropriate] administrative level, and all acknowledged the pressing need for enhanced provision of AT [assistive technology] services and supports. Administrative buy-in and acknowledgement of the salience of the problem (lack of AT use) were identified as key elements to our potential success. After discussing the key traits listed above, [these] stakeholders identified several potential programs, and we initiated conversations with those that appeared to align most completely with our list of essential features.

It is also important to gauge the level of commitment at a site. One principal investigator, whose team faced considerable resistance at one site, concluded, "The important lesson is to pick a school where staff are aware that they really need what you're trying to sell them." Another grantee worked in a school with relatively high-achieving students where staff had little incentive to take on the often uncomfortable changes the model required in their practices, schedules, and responsibilities. Successful early implementation efforts occurred in sites where personnel not only recognized the need the model addressed, but placed a high priority on addressing it.

Also valuable in a readiness assessment is attention to the extent to which a site has the basic resources needed to implement a model or technology tool. MDP and technology implementation projects often brought resources to a site (e.g., PD personnel, curricula and supporting materials). However, site resources also were required (e.g., release time for staff to attend training sessions, access to up-to-date software and hardware, sufficient broadband

strength). The absence of site resources sometimes became a serious threat to implementation. For example, personnel from one project with a tiered intervention model attempted to work in schools that could not provide staff for the tertiary-level interventions because of budget constraints, thereby eliminating the potential benefits of these supports to students.

Leaders of technology implementation projects in particular needed to pay attention to the technology requirements of their tools and the readiness of their sites. Most administered surveys to assess practitioners' comfort and experience with using technology. Some projects required that students have high-speed Internet access, which meant that project staff had to test each site's bandwidth to make sure that groups of students could access the Internet at once. In addition, many technology implementation project personnel found it necessary to work with district/school information technology staff to overcome firewall problems. Some grantees found that schools did not have enough computers for students to each have one and had to purchase additional computers. As one leader explained,

"We used a technology usage questionnaire to determine teachers' levels of comfort with using technology, how they are currently using technology in their classrooms, and what types of technology they are currently using to supplement instruction for their students in special education."

—A technology implementation project leader

The biggest challenge to implementing technology at the school was the sheer size of the classes and therefore the number of laptops needed for each class. We had to rely on a hybrid of our hardware (laptops) and the school's technology as well. The school had a laptop cart of PC computers that we used for one of the four classes that participated. All other classes used our laptops.

When implementation challenges arose in later implementation stages, some grantee leaders regretted that they had not conducted a more thorough assessment of site conditions at the beginning. For example, the leader of an MDP that decided to discontinue implementation at one of its sites reported that if her team members had spent more time on site during the initiation stage, they would have discovered that the site was not a suitable partner.

Continue to Assess and Understand Organizational Context

Assessing site conditions does not end at the selection stage, according to MDP and technology implementation project leaders. Rarely did their projects work in a problem-free site; implementation challenges arose in virtually all sites to some degree. Grantee leaders observed that assessing the fit between the model or technology tool and site conditions was an ongoing process as sites moved through the various stages of implementation.

The organizations that implement models or technology tools operate in multilevel systems that differ in complexity. Throughout implementation, grantee staffs worked to identify conditions that might facilitate or hinder implementation. "It is important to understand the baseline, to get a clear understanding of where the school is, what they have, and what they need," asserted one principal investigator. As grantee staff members identified the gaps between the capacities of the implementing organizations and those required for successful implementation, they could determine whether they needed to build capacities at the site or

adjust the model to existing conditions. Grantees used a variety of methods to obtain information about site conditions. The members of one grantee team shadowed high school students for a day to get a sense of what was going on at the school. They were able to observe pedagogy and obtain a snapshot of what students experienced in a typical day, information they reported was valuable because it gave them a starting point for discussions with school personnel. Another MDP leader described a process whereby project staff shared findings from site-based observations and interviews with site staff, then asked, “Are we correct about the way you view this?” By soliciting this kind of feedback, teams reported being able to construct an accurate picture of the implementation environment.

Other methods for gaining an understanding of site conditions included attending meetings and training sessions at the sites. Staff members from one grantee reported that they attended district PD sessions on the district’s RtI program to determine how the model could be incorporated into existing practices and policies. Some grantee leaders reported attending staff meetings to gauge aspects of the organizational climate that might affect implementation. Grantee teams also conducted formal needs assessments, and one principal investigator reported that her team had site staff examine existing data, suggesting, “Let’s look at your data and see if you’re satisfied with what you see.” This process reportedly helped site personnel identify where they needed help. Staff surveys were another way to understand both needs and strengths in the implementation context.

“We try to get a feel for the power structure and who are the power people who make things happen.”

—An MDP leader

Gaining an understanding of an organization’s key players and their strengths is another aspect of understanding site context. For example, one site experienced implementation challenges because of an unusually powerful union. MDP staff indicated that if they had realized up front that the union wielded such influence, they could have worked to build relationships with it before conflicts arose.

Focus on Developing Leadership Capacity

The PD supports that grantee teams designed and provided were most often aimed at the staff members who directly interacted with students. Yet grantee personnel were keenly aware of the critical role of school and program leaders in providing the administrative support that would enable frontline staff to commit to a model that could ultimately take hold and be sustained. Research on organizational change and school reform efforts highlights the critical role leaders play in creating a shared vision, effective processes, and monitoring and evaluation systems to support change (Hall & Hord, 2011). Therefore, grantees often made PD and coaching available to administrators on such topics as aligning district resources to support the model and also actively encouraged administrators to attend relevant meetings with their implementing staff. Training for organizational leaders and clear expectations for their involvement can underscore the role of sustained leadership in creating an implementation environment that supports success. When leaders provide concrete “facilitative administrative support” (National Implementation Research Network, n.d.-b), such as changing the school schedule to provide time for teams to do model-related work or redefining job descriptions to delineate staff responsibility for carrying out model components, they communicate that they are fully behind the changes entailed in adopting a model or technology tool and expect a similar commitment from staff.

In addition to working with administrators, a number of grantees worked to develop practitioner leaders to support the work of the MDP or technology implementation project. Creating school-level leadership teams of both teachers and administrators was an important implementation strategy of one grantee. In this example, these teams were responsible for identifying resources needed prior to implementation, communicating the project's goals to school staff, determining PD needs, and working out the details of model components (e.g., deciding how supplemental supports within a tiered system would be delivered). Leadership team members attended an extra day of training during the project's summer institute and met regularly during the school year to assess implementation progress and address challenges. Similarly, an MDP working in the early intervention system included select practitioners in all site planning meetings. Leaders of these projects and others believed that it was important to empower practitioners as leaders to increase the number of champions for the project and to widen the base of knowledge and expertise about the intervention's goals and procedures. Leaders of one MDP team added that to increase the sense of ownership, even in the project's early stages, they wanted model implementers going to their peers with questions rather than relying on MDP staff.

In an effort to build sustained leadership capacity, grantee leaders also reported creating procedures and tools specifically for site leaders. Written instructions for walk-throughs to observe instruction or service delivery, fidelity checklists, protocols for data team meetings and other procedures, as well as descriptions of leaders' roles for supporting the intervention were among the leadership tools cited.

Build the Support of Stakeholders

In addition to practitioners and site leaders, some grantees included other stakeholders such as district leaders, parents, and community leaders in the capacity-building process, expressing the belief that long-term success depended on widespread support for the intervention. In fact, MDP teams involved in post-implementation follow-up studies reported that having a deep bench of supporters was important to model sustainment. Several projects, for instance, marshalled the support of either existing or newly formed advisory groups. Similar to the school leadership teams described earlier, these groups included representatives of school or program staff who were directly involved in the intervention; however, they also often included individuals who were not directly involved, such as community leaders and parents. One MDP convened its advisory groups quarterly to obtain feedback on the project's logic model, review formative and student outcome data, and make suggestions for improvement. All participants served as advisors, but some also became advocates for the project. Building the involvement and commitment of individuals outside the host organization was especially important for grantees that were working to address system-level issues, such as those focused on youth transitioning from juvenile justice facilities into the community and those working to improve local and state-level guidance and procedures to improve young children's access to assistive technology. Grantee leaders reported that involving key systems-level decisionmakers in their projects was an important strategy to obtain leverage in systems change work.

Some MDPs and technology implementation projects reached out specifically to parents in their efforts to build support and capacity for the interventions. For example, a technology implementation project used parent consultants to meet with other parents to raise their

awareness of the intervention and obtain their input on products to supplement this project's online curriculum. In another example, a school-based MDP communicated regularly with parents via a quarterly newsletter and a presence at back-to-school night and other school events. All these strategies were meant to build broad awareness, support, and involvement in the projects among a variety of stakeholders.

Help Sites Identify and Develop Facilitative Infrastructure

Meaningful changes in schools and programs are more likely to be sustained when the systems around them adapt to support them. Successful implementation often requires changes in PD systems, resource allocations, communication systems, and staff supervision and support. For grantees with school-based interventions, this often meant identifying and accessing district-level supports and resources in addition to those provided by the grantee. When MDP and technology implementation project efforts were not linked to simultaneous infrastructure supports, implementation sometimes floundered, as an MDP leader observed for one site: "There is district support for [model practices]...but not clear expectations for schools to implement them...and no PD to help them do it."

Some MDPs and technology implementation projects looked for opportunities to nest aspects of their work in a larger organization that would support implementation and sustainment of the intervention and potentially its spread after the end of the project. For example, several grantee teams partnered with long-standing technical assistance networks in their states that helped to take the interventions or core components of them to other sites in their states. Reflecting an appreciation for a supportive infrastructure, a leader of one of the tertiary behavior intervention MDPs stated, "The biggest learning...is that intensive intervention with kids who have the most intensive needs cannot be done in isolation...it must be done within a system." Another MDP leader indicated that, "The real emphasis should be on systems...and how to infuse capacity building so that the [model] will live on."

Use Multiple Mechanisms for Staff Supports

A continuing challenge to MDP and technology implementation project implementation was site staff turnover, which resulted in even effective capacity-building strategies having limited impact. PD and coaching activities that support implementation on site may need to be repeated frequently to accommodate a continuing influx of new staff members. Even during the grant period such repetition can drain resources, and after grants end staff turnover could quickly undercut the ability to sustain the model or technology tool unless additional support strategies were used. For example, several grantees developed web-based teacher training modules that could be accessed on demand to accommodate the staffing realities at sites.

To bolster support mechanisms for sites, some technology implementation projects used no-cost course management systems with centralized server hosting to make their PD manuals, videos, and project resources available for new staff. In addition, several grantees made their materials and resources compatible with multiple hardware and software packages to accommodate the purchase of new or different equipment. For example, one grantee explained that some schools in the project used Google Chromebooks and software, while the project team used Microsoft Word. This created a compatibility issue because the materials were not being converted properly via the Google software, and the Word documents could not be opened. The grantee resolved this issue by making materials available in both Word and Google formats. As

the principal investigator explained, “With more schools in [state name] and nationwide deciding to use Google Chromebooks as a cost-efficient alternative to spending money on software licenses and servers, we realized that we needed to provide content in multiple formats.” These types of additions can increase the acceptability and fit of the interventions across sites, build capacity for successful implementation, and improve the potential for sustainment.

Encourage a Culture of Collaboration

In addition to creating a collaborative environment between grantee and site staffs, fostering a culture of collaboration among site personnel was said to improve implementation and was cited as a factor in sustained implementation. A number of MDPs and technology implementation projects featured intervention components that required collaboration among site personnel such as data team meetings, cross-disciplinary intervention teams, and coordination among different service providers. A benefit of these collaborative features may have been a more collegial culture at the sites. For example, an MDP leader involved in one of the follow-up studies to examine the extent of model sustainment observed, “Close relationships between practitioners helped to facilitate the continued use of the strategies.... They often used informal conversations with one another to brainstorm and discuss their use of strategies.”

Professional learning communities (PLCs) and communities of practice are two approaches to promoting collaboration, interaction, and discourse among practitioners with a shared interest (Buysse, Sparkman, & Wesley, 2003; DuFour, 2004; Little, Gearhart, Curry, & Kafka, 2003; Thompson, Gregg, & Niska, 2004). Some grantee teams leveraged existing mechanisms for collaboration. An MDP focused on literacy instruction for English learners was one of several grantees that were successful in building shared learning opportunities within established collaborative processes. This MDP team helped the PLCs, as well as newly formed data teams at PLC members’ sites, develop protocols and processes for reviewing student data and work collaboratively within the PLC or data team meeting to develop strategies for addressing students’ needs. Similarly, a technology implementation project reported that teachers participated in weekly PLC meetings organized by grade-level teams. During these meetings the PLC members looked at student data, discussed what the data meant, and worked together to refine their practices. Several MDP and technology implementation projects helped sites create PLCs or communities of practice to facilitate practitioner engagement. For example, one MDP developed a schoolwide PLC whose members planned together to teach the same content, analyzed teacher and student data, and identified mutually agreed upon topics for professional learning.

Collaboration was especially important when implementation required working across different disciplines, departments, or units. For instance, several cohorts implemented interventions in general education classrooms (e.g., core literacy instruction), but intervention practices also were expected to influence the process of determination of special education eligibility. One cohort’s tiered writing interventions were implemented in language arts classes, but writing skills were to be reinforced in academic content courses such as science and mathematics. In addition, MDPs in the early language intervention cohort typically involved speech-language pathologists although other service providers working with the identified children (e.g., occupational therapists, physical therapists) also were provided supports so they, too, could become proficient in and use model practices. In these instances, grantee leaders often

found that practitioners in the secondary discipline or department did not have the same motivation or incentives to change their practices as those who were more centrally involved. Attention to creating opportunities for cross-disciplinary or cross-departmental collaboration was said to be an important strategy for these grantees.

Invest in Partnerships

The implementation context for many grantees involved more than one program or system, each with its own procedures, cultures, and needs, and these multi-organization partnerships added to the complexity of implementation. Research has identified a number of common barriers to interagency collaboration (e.g., Benz, Lindstrom, & Latta, 1999; Noonan, Morningstar, & Erickson, 2008), including lack of mutual understanding, unclear procedures for communication and collaboration, and inconsistent or nonexistent mechanisms for sharing client information. Barriers such as these challenged the grantees involved in strengthening or building partnerships between organizations. MDPs in the tertiary behavior intervention cohort, for example, had planned to reach outside the education system to community-based mental health and other organizations to identify additional supports for students with the most serious behavioral needs. Although some community connections were made, the partnerships that grantee leaders had envisioned did not materialize because of limited staff and resources to develop and nurture them.

Some grantees were successful in developing and nurturing interagency partnerships. The MDPs working with youth reentering the community from the juvenile justice system, for example, experienced some success in collaborations among juvenile justice facilities, school districts, and community agencies. Grantee leaders reported that their use of an interagency tool kit¹¹ provided a needed structure for addressing issues related to collaboration. Improved partnerships helped them connect youth to needed community services and aided in addressing policy and practice barriers in serving at-risk youth (e.g., interagency sharing of records and more effective referral processes). Leaders of these projects reported that this kind of work requires partners to develop a deep understanding of the different organizations and people involved, adding that this takes time and intentionality.

Systematically Work to Transfer Ownership to Site Staff

Most MDP and technology implementation projects began their work intending that their interventions would be fully implemented and then sustained by the sites' organizations when the grant-funded work was completed. In fact, two principal investigators pointed to their implementation strategies as contributing directly to sustainment. For instance, one team had "built sustainability into the project as a core implementation component from day 1." Their approaches to PD and coaching, in particular, emphasized building local capacity for sustainment from the outset so that sites could effectively take over implementation independent of the grantee team. Another grantee team described a different strategy as a key factor in sustainment. Elements of that strategy included initially involving only teachers who volunteered to participate in the MDP, thereby ensuring support, and having teachers and other school staff members provide leadership in site team meetings rather than relying on MDP staff.

¹¹ <https://ici.umn.edu/evaluation/docs/ReintegrationToolkit.pdf>

Several grantees made use of new technologies to build model or technology tool sustainment. One technology implementation project developed a virtual community of practice to provide a sustaining network of users in support of children with significant challenges. The community of practice featured a forum where users could write and follow posts about issues related to the target population, a community library where a moderator could promote especially helpful posts, a shared science section for storage of assessment data, and brief videos and downloadable documents to promote the community of practice. According to the principal investigator,

“Our strategy was to build more of a grassroots effort; teachers own it and carried it through, which has contributed to long-term success.”

—An MDP leader

Our project will rely on crowdsourcing the support that professionals and parents need to address the educational challenges of the target population. It is our hope that our community will expand far beyond the initial “Charter Members” [the professionals and parents at the sites] to include people around the world who use the [tool].

In another effort to support sustainment, a technology implementation project used an online learning portal developed by a state department of education and housed on its server. Project staff members were granted permission to use the portal to centralize materials and resources in a teacher “tool kit” that allowed for streamlined access to student content, lesson plans, grading, discussion forums, and more. Embedding materials within this existing infrastructure was a strategy to promote sustainment.

All the MDP and technology implementation grantees encountered challenges when they installed their models or technology tools in real-world organizations. For some grantees, these challenges resulted in low-quality implementation, sites pulling out of projects or grantees pulling out of sites, or lack of sustainment. Yet despite significant barriers, some grantees were able to achieve successful and sustained implementation. Leaders of these projects emphasized the importance of explicit and well-executed strategies such as those addressed in this chapter to build the capacity of participating sites to guard against the many potential threats to high-quality and sustained implementation.

6. Facilitating Implementation Through Evaluative Feedback

The fundamental purpose of MDPs and technology implementation projects is to learn what it takes to establish and sustain models and technology tools in real-world contexts. Mechanisms for continuous learning and feedback are critical to achieving this goal. Formative evaluation activities can provide information on how well different components of a project are being implemented and help grantees and site staff determine whether progress is being made, milestones are being met, and objectives are being achieved. Formative results also can be used to communicate with stakeholders about how implementation is going, resources and supports that are needed, and whether the emerging outcomes are worth the organization's investment.

Using formative evaluation feedback to refine intervention and implementation components was required by OSEP's RFAs for both MDPs and technology implementation projects. They asked applicants to specify a plan describing "how the formative evaluation will use clear performance objectives to ensure continuous improvement in the operation of the proposed project, including objective measures of progress in implementing the project and ensuring the quality of products and services" (Office of Special Education and Rehabilitative Services, January 9, 2014). Evaluating implementation includes examining the context in which implementation occurs, whether and how well implementation and intervention components are delivered as intended, and implementers' and recipients' perceptions of and feelings about implementation and the intervention (Century, Cassata, Rudnick, & Freeman, 2012; Century, Freeman, & Rudnick, 2008; Hall, Dymnicki, Coffey, & Brodowski, 2014). Ongoing analysis of these factors enables leaders to recognize real or potential problems early, respond quickly, and make necessary adjustments before problems cause significant delays or derail implementation.

Despite the value that can be derived from carrying out an effective and ongoing program of formative evaluation, the realities faced by grantees often constrained their efforts to do so. The activities required to prepare for and successfully achieve implementation often absorbed their relatively limited grant funds, and the already heavy implementation demands on site staff dissuaded some grantees from expecting additional data collection from them. Therefore, the strategies and activities highlighted in this chapter are drawn partly from grantees' experiences but also from the literature on implementation research and formative evaluation to illustrate how formative evaluation approaches can support implementation of models and tools. Those activities involve developing a comprehensive evaluation plan, measuring various aspects of implementation and outcomes, and using data to improve implementation. This chapter is organized around these strategies.

Develop a Comprehensive Formative Evaluation Plan

A strong and well-implemented formative evaluation plan is essential for assessing and accelerating progress toward high-quality implementation and increasing the odds of improving outcomes. A successful plan begins with a plausible theory of change that articulates the conceptual connection between the intervention and intended outcomes (Connell & Kubisch, 1998; Weiss, 1972). A logic model, often used to depict the theory of change, typically includes inputs (e.g., resources, staff), activities (e.g., processes, events), outputs (e.g., changes in service delivery), and outcomes (e.g., changes in participants' behaviors or skills). Articulating a theory

of change helps developers and implementers identify what needs to occur to produce the desired outcomes and determine the focal points of evaluation activities to assess whether the necessary activities and conditions have been achieved.

Planning for formative evaluation involves specifying measures, how often and when they will be administered, who will administer or collect them, how they will be recorded and analyzed, and who is responsible for monitoring evaluation activities to make sure the plan is being followed. Identifying the measures and procedures early will aid in determining whether the project has the needed resources and staff and making adjustments, if necessary.

Evaluation methods need to be practical and useful, especially if sites are expected to implement and use them independently (Blase, Fixsen, & Phillips, 1984). Therefore, it is important to balance the need for thorough and intensive measurement strategies, which can be costly (in terms of time and resources), with the need to have a feasible, cost-effective approach. With limited resources, MDP and technology implementation grantees can make strategic choices about the most valuable investments for evaluative purposes. Practical data collection activities that can be incorporated into existing practices at sites may help site personnel enhance their ability to use data for service delivery and program improvement. Evaluating the plan and making sure it is yielding useful and credible information is another component to effective formative evaluation.

MDPs and technology implementation projects often used informal feedback (e.g., from conversations with site personnel) to learn about site conditions, how implementation was going, and how it could be improved. When grantee leaders had built strong relationships and trust with site staff, this kind of feedback was reported to be invaluable. However, having a systematic plan with objective measures helped grantees ensure that activities that were critical to achieving desired results were occurring and that mechanisms were in place to detect and correct problems.

Document Implementation Processes and Contexts

The purpose of documenting implementation processes is to understand and describe how the intervention is being implemented and the contexts in which it is being implemented. This requires collecting information on implementation activities and procedures, as well as characteristics of participating sites and their external environments, the individuals delivering the intervention, and the recipients of the intervention (James Bell Associates, 2008; Saunders, Evans, & Joshi, 2005).

Document Activities and Processes

Documenting processes and activities provides valuable information for understanding and verifying what actually occurred during implementation and helps grantees begin to document features, activities, and conditions leading to a successful model or technology tool for replication and dissemination purposes.¹² Grantees used a variety of methods to understand, learn from, and document their implementation experiences. Some instruments were prepared by MDCC to help grantees in various cohorts collect information on implementation activities, processes, and contexts as part of requirements to collect common measures within their cohort.¹³ The MDCC Project Template was used by grantees across the cohorts to document

¹² See MDCC brief, *Planning for Replication and Dissemination from the Start: Guidelines for Model Demonstration Projects*, available at http://mdcc.sri.com/documents/MDCC_ReplicationBrief_SEP2015.pdf.

¹³ Requirements for common measures were specified in the grant funding application and varied by cohort.

implementation experiences. An Intervention Specifications Template also was completed by grantees in some cohorts to document features of their intervention and implementation components. These templates are described below and are included in Appendix D.

- **Project Template.** Grantees used this template to record the story of intervention development and implementation, including factors that helped or hindered implementation. Completing sections for each implementation stage documented how grantees learned and how they used evidence and experience to iterate on the intervention components and implementation strategies. Many grantee teams completed the template collectively to facilitate conversations about what was working, where opportunities existed to strengthen the intervention and its implementation, and strategies for handling site-based issues.
- **Intervention Specifications Template.** This template documented the specific features and design elements of each grantee's intervention and implementation strategies. Grantees revised their template each year to reflect changes that had been made on the basis of the previous year's experiences and decisions and to note aspects that were functioning as planned.

Grantees used additional methods to document implementation and intervention components, activities, and experiences, including generating written summaries of PD sessions; compiling site visit notes; and preparing materials for site personnel, such as written intervention procedures, user manuals, and guidance documents.

Collect Information on Contexts and Participants

Because implementation processes and outcomes are affected by the nature of the participating organizations and their environments, as well as the characteristics of the target population, it is important for grantees to collect and record contextual information. This information will help grantees and potential intervention adopters understand the settings and conditions that contributed to successful or unsuccessful implementation. For some cohorts, MDCC worked with grantees to develop common instruments for documenting contextual information; however, grantees also created their own instruments for this purpose. Example instruments include:

- **Site surveys and profiles** that documented features of each site (e.g., school, district, early intervention program, juvenile justice facility), including characteristics of the population served (e.g., age, disability type), staffing (e.g., number and types of staff), leadership (e.g., tenure, leadership style), organizational climate (e.g., controversial issues, crises, staff morale), and experience with related interventions. Grantees also used publically available sources to collect site information (e.g., U.S. Department of Education Common Core of Data¹⁴ for information on schools such as enrollment, racial/ethnic composition, and percentage of students eligible for the free or reduced price lunch program).

¹⁴ <http://nces.ed.gov/ccd/>

- **Practitioner surveys** that collected information on those delivering the intervention, such as level of education, roles and responsibilities, and previous training and experience with related interventions.
- **Family surveys** provided information on children and families, such as the child's level of functioning, whether the child had a diagnosed disability or health condition, educational history, and family members' experience with or knowledge about related interventions.
- **Administrative records** documented the population served, such as students' age/grade level, race/ethnicity, eligibility for special education, eligibility for the free or reduced-price lunch program, and scores on standardized tests.

Grantees also used other methods, such as document reviews, focus groups, interviews, and surveys to understand baseline conditions at sites, identify potential implementation obstacles and facilitators, and detect changes in organizational context and functioning over time.

Assess Fidelity

Fidelity assessments measure the extent to which implementation and intervention components were delivered as intended. Much of the literature addresses *intervention fidelity*, the degree to which an intervention was delivered as intended to the target population (e.g., students). In recent years, however, there has been a call for those developing, installing, and supporting interventions to assess *implementation fidelity*,¹⁵ the extent to which activities, resources, and materials required to support the people and systems implementing the intervention (as specified in the theory of change) occurred as intended (Carroll, Patterson, Wood, Booth, Rick, & Balain, 2007; Lee, Altschul, & Mawbray, 2008; Mihalic, 2004). Without assessing fidelity, it is not possible to determine whether the absence of impact is due to poor implementation or lack of effect of the intervention on outcomes. Similarly, positive outcomes can result from true intervention effects or from factors unrelated to the intervention; only by measuring fidelity can this determination be made.

The first step in developing appropriate fidelity measures is to have clearly defined implementation and intervention components (Blase & Fixsen, 2013). With clearly defined components, developers can begin creating fidelity measures by determining which components will be assessed for fidelity, how they will be assessed (measures, procedures, frequency), how fidelity levels will be defined (e.g., acceptable or unacceptable), who will collect the measures, and who will monitor whether components are being implemented consistently.

Researchers have identified the following primary elements of fidelity (Dane & Schneider, 1998; O'Donnell, 2008).^{16,17}

¹⁵ A number of terms are used in the literature to refer to fidelity (e.g., fidelity of implementation, treatment fidelity, treatment integrity, fidelity, organizational fidelity). We use "implementation fidelity" to refer to the extent to which implementation components such as PD and administrative activities were conducted as intended and "intervention fidelity" to refer to the extent to which intervention components were delivered as intended to the target population (e.g., children).

¹⁶ These fidelity elements are typically associated with measures of *intervention fidelity*; however, they can also be applied to measures of *implementation fidelity*.

¹⁷ A fifth element, program differentiation, also can be an element of fidelity. It pertains to whether the intervention's features are sufficiently different from "business as usual." This element is important in group

- **Adherence**, which captures the extent to which the behaviors of individuals supporting or implementing the intervention (e.g., PD providers, site administrators, and practitioners delivering the intervention) conform to specified plans (Hogue, Henderson, Dauber, Barajas, Fried, & Liddle, 2008). Measures of adherence focus on the quantity or presence of prescribed behaviors defined in such products as a theory of action or logic model, prescribed procedures for implementation components, or by an intervention protocol. Adherence measures evaluate those components specific and essential to the defined intervention or implementation components.
- **Quality of delivery** refers to the skillfulness of delivery of implementation or intervention components and includes interpersonal- and process-level skills (Forgatch, Patterson, & DeGarmo, 2005; Perepletchikova & Kazdin, 2005). Competence in delivering implementation components or an intervention includes qualities related to communication, technical abilities, and skills in responding to participants.
- **Exposure or dosage** indicates how much of the intervention or PD was delivered to participants. This can be measured by units covered or the amount of time participants were exposed to the intervention or PD.
- **Participant responsiveness** indicates how engaged participants (e.g., school staff members attending PD sessions, students) were while receiving the intervention or PD.

Fidelity can be measured in a variety of ways, requiring different resources. Self-report methods typically measure adherence (although they can also measure other fidelity elements) by asking deliverers or recipients of intervention or implementation components whether those components were delivered or received. Self-report methods are generally less expensive and less time consuming than observational methods; however, they may produce less valid data than observations (Breitenstein, Gross, Garvey, Hil, & Resnick, 2010; Lillehoj, Griffin, & Spoth, 2004; Perepletchikova, Treat, & Kazdin, 2007). Fidelity observations typically measure adherence and competence and sometimes participant responsiveness and generally are considered more accurate than self-report (Dusenbury, Brannigan, Falco, & Hansen, 2003). In-person, real-time web-based, and video recorded observations can be used to assess fidelity, with each method having advantages and disadvantages related to cost, burden, validity, and reliability (Dumas, Lynch, Laughlin, Smith, & Prinz, 2001; Eames, Daley, Hutchings, Hughes, Jones, Martin, & Bywater, 2008; Forgatch et al., 2005).

Measure Intervention Fidelity

Research has found that intervention fidelity affects the relationship between interventions and intended outcomes (Carroll et al., 2007). For example, some authors have compared outcomes in high versus low intervention fidelity conditions and found that effect sizes were three times larger for students in the high-fidelity group (DuBois, Holloway, Valentine, & Cooper, 2002). To determine whether outcomes can be attributed to the intervention, it is critical to evaluate whether and how well intervention components were delivered as intended. Intervention fidelity measures also help identify gaps in practitioner competencies and practices that can be addressed by PD, coaching, or administrative support.

design research in which one group receives the intervention and another group does not. However, most MDP and technology projects did not feature a group research design; therefore, this element was mostly irrelevant.

The RFAs for grantees in the MDP cohorts specified that grantees collect data on intervention fidelity;¹⁸ however, the methods to be used were not specified. Because fidelity measures need to align closely with specific intervention components, most MDPs developed project-specific fidelity instruments, which differed widely. Some MDPs used practitioner self-reports, others used observations, and some used multiple methods. MDP teams typically assessed fidelity on some, but not all intervention components. For example, MDPs implementing interventions within tiered systems of support often included fidelity measures of core instructional practices but not of supplemental or intensive supports.

Leaders of several MDPs reported beginning with the NIRN-developed Practice Profile (National Implementation Research Network, n.d.-a) to identify the essential intervention practices required for high-quality implementation. One MDP that focused on improving young children's access to and use of assistive technology, for example, worked with site personnel to complete the Practice Profile. The completed tool guided development of a multiple-component fidelity assessment that included a review of documents such as IEPs, questions to families about topics covered and services received in their sessions with practitioners, and practitioner self-report.

Practitioner self-reports were more common in the cohorts focused on interventions for young children, perhaps because observations of individual sessions with children and families were more intrusive and less practical than observations in classroom settings. For example, two of the three MDPs in the early childhood language intervention cohort used self-reports of practitioners and parents to assess fidelity. The third MDP asked providers to video record sessions with families and review them to score their own fidelity, and parent fidelity was measured periodically via observations by independent observers in the home.

MDPs with classroom-based interventions typically developed structured observational checklists to assess intervention fidelity. For example, one MDP created a checklist based on components of the core curriculum and the MDP's list of recommended activities to assess fidelity of core reading instruction. Similarly, an MDP addressing the literacy needs of English learners created a checklist of culturally responsive literacy practices. Both these MDPs gave participating teachers the checklists and periodically observed instruction to record whether identified practices were in evidence. Some MDPs with classroom-based interventions supplemented observational data with teachers' self-reports of whether and/how often they used specific practices.

In a few cases, MDPs used existing fidelity measures if they aligned with their interventions. For, example, two MDPs focused on tertiary behavioral interventions used an instrument that had been developed specifically for evaluating fidelity of secondary- and tertiary-level interventions in a Positive Behavior Intervention System (PBIS) framework.

Most MDP fidelity instruments measured adherence, and some measured quality of delivery. Only a few measures of exposure/dosage or participant responsiveness were reported. Dosage for one MDP was measured by teachers' documentation of units covered. Other MDPs had teachers or service providers document the number of intervention sessions conducted with each participant. To measure student responsiveness, one MDP team used an existing instrument to assess students' academic response through classroom observations, and another MDP

¹⁸ Although many technology project grantees collected intervention fidelity data, it was not required.

included items about students' response to intervention-related instruction in its fidelity instrument.

MDPs also differed in how they scored and used fidelity assessments. Most produced quantified fidelity scores, although not all specified thresholds for acceptability. Some used a predetermined threshold score to identify implementers who needed additional supports. One MDP, for example, used fidelity scores to determine the intensity and frequency of coaching support to teachers. Other MDP teams did not specify a threshold score but used fidelity assessments to help all implementers improve practice, regardless of their score.

Measure Implementation Fidelity

Evaluating implementation fidelity helps developers determine the extent to which implementation activities were conducted as intended, identifies the supports and resources required for high-quality implementation, and supports replication of the intervention (Darrow, Goodson, & Boulay, 2014). This kind of assessment is integral to the purpose of MDPs and technology implementation projects to determine effective approaches to implementing models and technology tools in real-world settings, a purpose that is different from assessing fidelity in intervention research where the focus is on the integrity of the treatment that is being evaluated.

An examination of implementation fidelity considers the quality and occurrence of such activities as staff selection, PD and coaching, support for administrators and other personnel, and evaluation (Fixsen et al., 2005). Although the quality of these activities is essential for successful implementation, rarely are they evaluated. Guskey (2000) noted, "Seldom is the professional development component thoroughly described or evaluated in sufficient detail to offer practical guidance for those wishing to understand the complexities of the improvement process" (pp. 4-5).

MDPs and technology implementation project grantees evaluated the quality of some implementation activities. For example, many grantees asked PD participants to provide survey feedback on the sessions and suggest improvements. A few grantees indicated that they also administered surveys and conducted focus groups to evaluate the quality of coaching provided. Often, however, feedback about implementation strategies came from informal feedback as grantee staff interacted with site personnel. Most grantees also recorded the dates, topics, and duration of PD activities, and some had coaches use logs or other formats to record information about coaching sessions.

These evaluation activities, however, generally did not appear to tie into an assessment of whether implementation activities were conducted as intended. Grantees leaders may have had general ideas about the activities, resources, and supports that were necessary and were using the MDP or technology implementation projects to better understand the supports that were needed. Grantees' experiences seemed to be consistent with implementation science researchers who have observed that assessing fidelity of implementation is not a common practice. Nonetheless, this kind of assessment can help grantees better understand implementation and intervention outcomes, as well as the resources and supports that are necessary for successful implementation and sustainment of the model or technology tool over time.

Measure Social Validity

Another method some MDP and technology implementation project grantees used to obtain feedback on their models and technology tools was an assessment of their social validity, “a term coined by behavior analysts to refer to the social importance and acceptability of treatment goals, procedures, and outcomes” (Foster & Mash, 1999, p. 1). Some researchers have argued that implementers’ acceptance of the intervention must happen before their commitment to high-quality ongoing implementation can be expected (Elliott, 1988). In addition, measuring the social significance is an essential supplement to evidence of the effectiveness of an intervention (Carter, 2010; Marchant, Heath, & Miramontes, 2012).

Although the construct of social validity has been conceptualized in a variety of ways (Schwartz & Baer, 1991), researchers have identified three main dimensions of social validity that should be consistently evaluated throughout the implementation process (Van Houten, 1979; Wolf, 1978):

- **The social significance of the goals of the intervention**, i.e., the extent to which the goals meet the demands of the social community to which program participants belong. Choosing an intervention that aligns with practitioner or site priorities helps build buy-in among implementers and increases the likelihood of its sustained use and even replication (Marchant et al., 2012).
- **The perceived social appropriateness of the intervention’s procedures** can powerfully influence the willingness and ability of practitioners to use the intervention and of participants to accept it (Foster & Mash, 1999), as interventions that are costly to implement or that involve complex steps or high levels of training may not generate the commitment needed for successful or sustained implementation (Daunic, Smith, Brank, & Penfield, 2006).
- **The social importance of the intervention outcomes** involves both their importance to direct participants and their significant others (e.g., middle school students participating in a newly introduced writing program and their parents) and the value placed on those outcomes by the target population at large (e.g., all students and parents in the school or district). It is important to recognize that obtaining a statistically significant change on an outcome measure does not necessarily mean that the change is meaningful for the program participants and other consumers (Turan & Meadan, 2011).

These aspects of social validity can be assessed in a variety of ways. For example, one approach involves examining the contribution of the intervention goals to functional performance or impairment in potential participants’ lives (Foster & Mash, 1999). The social appropriateness of an intervention’s procedures can be measured by presenting potential participants and practitioners with vignettes involving hypothetical intervention procedures and asking them to rate the acceptability of those procedures (Bagnato, Goins, Pretti-Frontczak, & Neisworth, 2014; Carroll & Peter, 2014). Consumer satisfaction surveys are another approach that generally relies on self-report questionnaires which ask participants to rate various aspects of the intervention on a specified rating scale (e.g., Bagnato, Neisworth, & Pretti-Frontczak, 2010).

Unlike for intervention fidelity, OSEP has not regularly required grantees to assess social validity, nor has it provided guidance on how it might be assessed. Nonetheless, some grantees did so, most often related to the PD they provided implementers. One MDP team reported

administering surveys to participants at the conclusion of each PD session. Reflecting on results after the first session, the MDP leader noted:

Teachers stated that the content was valuable but that the instructional modules appeared lengthy and that for some content-area teachers (e.g., math), they may not be able to spend the amount of time that it would take to implement modules with their content-area classes. Project staff debriefed during the staff meeting following each PD session.... All staff members provided positive highlights and at least one suggestion for improvement. Adjustments were incorporated into the next PD session.

Another MDP administered surveys to the student participants in the intervention, and another asked teachers who were implementing its instructional intervention to complete a “self-reflection survey” on the benefits of the model to their practices. Unlike this survey-based approach to assessing social validity, however, most grantees who solicited feedback did so informally (e.g., through conversations with implementers). One approach to a more thorough assessment of social validity has been developed by the OSEP-funded IRIS Center at Vanderbilt University,¹⁹ which is charged with developing and disseminating resources about evidence-based practices into preservice teacher preparation and in-service PD programs.

Measure Outcomes

Although outcome measures are typically viewed as the results assessed at the final stages of an intervention, there is also great value in assessing individual- and systems-level outcomes at the early and mid-stages of implementation. Periodic, ongoing outcome measurement can indicate whether or not the grantee’s goals are likely to be achieved, allowing sufficient time for the grantee to modify and course-correct as needed. Outcome data can also be used to improve implementation and intervention fidelity and social validity. For example, early outcome assessments that show promising results may encourage implementers to continue implementing the intervention with fidelity. Outcome data that have been collected over the course of a project also can document the effects of the intervention chronologically, which is particularly informative for an intervention that was modified over time. Although such data would not be valid for longitudinal analysis, they could strengthen the results of the project if the final intervention showed substantial improvements in outcomes compared with the original intervention assessed at the initial implementation stage.

To maximize the benefits of outcome measures in supporting the implementation process, the measures should be clearly aligned with the intervention’s theory of change and logic model. Specific questions grantees can ask themselves include: (1) Are the outcomes *reasonable*, given the intervention’s inputs (i.e., activities and practices), dosage, and participants? (2) Do the outcome measures appropriately assess the underlying constructs (i.e., are the assessments measuring what you *expect* them to be measuring)?

Once the intervention is under way, outcome measurements can be taken at various points throughout the life of the project, although they are particularly valuable at the early stages when

¹⁹ The IRIS Center, Sample Social Validity Questionnaire.
http://iris.peabody.vanderbilt.edu/module/fba/cresource/q3/p10/fba_10_link_questionnaire/

there is still sufficient opportunity to make adjustments. When reviewing the results of outcome assessments at the early and midpoints of an intervention, grantees can ask themselves the following questions:

- **Is the intervention on its way to serving the anticipated number of participants?** While meeting target sample sizes is generally of interest for analytic purposes (e.g., to ensure sufficient statistical power), it also can be a useful marker to indicate potential implementation problems. For example, low numbers of participants may suggest that grantee staff need greater support with recruitment or perhaps is an indication that people are reluctant to participate, thereby providing an opportunity to reflect on the reasons why there may be a lack of enthusiasm about the intervention.
- **Are outcomes moving in the right direction?** For instance, is a reading program actually improving reading skills or do the skills appear to be stagnant, perhaps in a particular subgroup? Are there specific components of the intervention that are particularly promising or adverse to the overall impact of the intervention?
- **Is the progress being made by participants adequate to ensure that the projected short- and long-term goals of the project are met?** Although immediate improvements in outcomes would not be expected, some degree of improvement is expected along the way. Pre-established early- and mid-stage benchmarks on the outcome assessments can help grantees monitor intervention progress over time.

MDP and technology implementation grantees were required to measure intervention outcomes for their target populations. Both common measures for all grantees in a cohort (for some cohorts) and those specifically selected by the MDP were based on the specific goals of the cohort. For instance, MDPs in the cohort focused on tertiary behavior interventions for elementary and middle school students used office discipline referrals and other behavior-related assessments, whereas MDPs in other cohorts used curriculum-based measures as primary measures of student progress. For example, one MDP used unit tests to assess how implementation of its writing intervention was going. When these tests indicated that students had not achieved specified levels of writing competence, MDP staff members modified PD and coaching activities and worked with teachers to identify the additional supports they needed. Many of the MDP cohorts included progress monitoring as a core intervention component, so these grantees had readily available measures of students' progress. Examinations of progress monitoring data or short-term outcomes helped grantee and site staff determine whether outcomes were trending in the expected direction. If not, adjustments in intervention or implementation components were made.

Use Evaluative Feedback to Improve Implementation

Collecting data takes time and resources. For those efforts to be worthwhile, the resulting data need to be effectively used for program improvement. A utilization-focused evaluation asks, "How will evaluative feedback be acted upon to improve implementation and outcomes?" (Patton, 2008). Having procedures and protocols in place to regularly review data, evaluate program activities, reflect on findings, and use results to identify areas for improvement will improve the usefulness of evaluative feedback. If data collection and analysis activities are too burdensome to be practical or do not produce useful information, alternative approaches should be considered. The experiences of MDP and technology implementation grantees suggest the following lessons.

Use Data to Build and Sustain Core Intervention Components

Evaluative feedback can help grantees determine which intervention components are essential for producing desired outcomes and which can be adapted without affecting the model or technology tool's integrity. Fidelity, social validity, and other types of data also can help grantees identify the features that are feasible and valued by site personnel and thus are likely to be sustained. Often grantees began with a feature they thought was essential but had to modify it after evaluative feedback indicated it was not feasible. A technology implementation project, for example, had expected all of its components to be administered through its online curriculum, but limited computer access and feedback from teachers led this team to supplement the online program with offline lesson activities that could be accessed by teachers at any time.

Use Multiple Types of Data to Examine How Implementation is Going

The grantees solicited a variety of forms of input to and feedback on their work and used the information to revise their interventions and implementation strategies over time. Practitioner surveys, observations, meetings, video recordings, and informal conversations with practitioners provided data that the grantee teams used to strengthen PD and adapt intervention components. For instance, teacher feedback was reported to have helped one MDP team refine its classroom observation instrument and procedures, and another team used teachers' input to develop materials tailored to their instructional content areas. Grantees also adjusted PD content to respond to site staff members' needs. In addition to helping the teams adjust intervention and implementation components, one MDP reported that the data provided by its online progress monitoring program helped motivate teachers to continue implementing the model as they observed students' scores increase. (See Appendix C for example tools to assess implementation at various stages.)

Involve Implementers and Stakeholders in Designing Evaluation Activities and Reviewing Results

Involving site personnel in evaluation activities can build their buy-in to the intervention as well as their commitment to data collection. A number of grantees involved site staff in developing evaluation tools, such as fidelity checklists and logs for documenting project activities, and some involved stakeholders in reviewing evaluative feedback. For example, one MDP team shared results with an advisory group quarterly and asked members to work with MDP staff to identify areas for improvement. Other grantees regularly shared data with school leadership teams or PLCs to engage them in a problem-solving process to improve implementation.

Foster a Culture of Learning and Use of Evaluative Feedback at Sites

Beyond involving site personnel in evaluation activities, helping them build their capacity to use data for continuous program improvement may benefit the project and sites' other improvement efforts. Data-based decisionmaking was a core feature of many MDPs and technology implementation projects, yet some of those grantee leaders reported that site administrators and practitioners often did not have the confidence or experience to use data effectively. They indicated that having project staff model using data for program improvement, providing PD and practice opportunities on using data effectively, and developing user-friendly

tools (e.g., reporting formats, checklists, data-use protocols) to facilitate data use were important strategies for building confidence and competence among site personnel in using evaluative feedback for instructional and program improvement purposes.

Encourage Reflection Among Grantee Staff

To become more intentional about their own learning, grantee teams may benefit from regular staff debriefings to consider their data and identify implications for the core intervention and implementation components. Some grantees incorporated this kind of self-reflection in their projects. Especially during their first year, when intervention components were still in development, one grantee's team members met regularly to assess how implementation was going and learn from each other. In addition to providing opportunities for reflection, regular meetings were used to strengthen the project team. As a leader observed, "You need to build your team first before you can work successfully with the schools." Another team also used regular team debriefings to better understand implementation successes and challenges and adjust accordingly. Intentionally making these kinds of regular investments in staff learning can have multiple benefits for intervention development and implementation.

The ongoing use of evaluative feedback is fundamental to the success of MDPs and technology implementation projects in implementing evidence-based interventions in everyday settings such as schools and early intervention programs. A strong formative evaluation plan, high-quality measures, and effective and timely use of data can help grantees evaluate progress and make adjustments to increase the likelihood of high-quality and sustained implementation and improved outcomes for children and youth.

7. Conclusions

OSEP seeks to effect large-scale change to significantly improve outcomes for children and youth with disabilities and their families. Despite continued federal investment in programs and services for them, these children's academic achievement continues to lag behind that of their peers in the general population. OSEP's recent emphasis on results-driven accountability represents a dramatic shift from a focus on state compliance to one on achieving improvements in early childhood, academic, and high school graduation outcomes. However, OSEP understands that more than effective programs and products are needed to produce these hoped-for improvements for children with disabilities. Achieving improved results also requires changing adult behaviors by effectively implementing evidence-based interventions. OSEP's investment in the State Implementation and Scaling-up of Evidence-based Practices Center, as well as its funding of the Model Demonstration Coordination Center (MDCC), demonstrates this increasing attention to high-quality and sustained implementation, as does the RFA requirement for MDPs and technology implementation projects to assess processes and outcomes and use formative feedback to improve both implementation strategies and core intervention components.

Implementing evidence-based practices in real-world settings is challenging. Decades of research on organizational change and the diffusion of innovations (e.g., Rogers, 2003) have documented the many obstacles that stack the odds against long-term change. Implementation science researchers recognize these challenges and work to identify practices that effectively address them. To achieve needed improvements in child and family outcomes, it is critical that evidence-based programs and practices be installed and supported with effective implementation practices.

For 10 years, the MDCC has been synthesizing findings from OSEP-funded MDPs and technology implementation projects within and across 10 cohorts of grantees to add to the knowledge base on effective implementation practices. The 34 grantees that worked with MDCC were involved with a wide array of interventions, target populations, and settings. Implementation experiences also varied widely, with some grantees achieving great success in the implementation of their model or technology tool, and others experiencing poor or inconsistent implementation and sites that were never successful in implementing the model or tool as intended. Results of post-implementation follow-up studies of the first three MDP cohorts showed that 50% of the original sites in these cohorts had fully sustained model practices, and a few MDPs saw spread of their models to new sites. Through all these experiences, valuable lessons were learned about the practices and strategies associated with high-quality and sustained implementation.

Consistent with the literature on effective implementation practices, the experiences of the MDPs and technology implementation projects suggest that how core intervention components are defined and adapted to fit local conditions affects implementation quality. These experiences also suggest strategies for building individual and organizational capacity that facilitate implementation success. Moreover, how grantees or others implementing evidence-based practices use evaluative feedback mechanisms to continually assess progress and quickly address

real or potential challenges influences the quality of implementation. Paying attention to the stages of implementation, including assessing sites' readiness to move to the next stage, is also important.

Much has been learned in the last decade about augmenting the evidence base on effective interventions and improving the implementation quality of education and social service programs. However, there is much more work to be done to achieve widespread, effective implementation that produces socially significant improvements in child, youth, and family outcomes. MDPs and technology implementation grantees have a role in building the evidence base for effective interventions. For their OSEP-funded grants, these grantees typically put together evidence-based components that had not been evaluated as a whole package. With their experience in how the models or technology tool packages can be best implemented and supported in schools and early intervention settings, the next step for many grantees is to test the efficacy of the whole model or technology tool package and continue to gather rigorous evidence about the components that are essential for producing desired outcomes. Grantees also can continue to evaluate the contexts and populations that benefit most from the interventions.

Continued investments in efforts to increase knowledge and practice related to effective implementation is needed. Sponsors (e.g., funders, policymakers) of demonstrations of evidence-based practices are in a powerful position to help developers, implementers, and policymakers pay attention to effective implementation practices. OSEP, for example, has promoted attention to implementation issues through requirements in its model demonstration and technology implementation RFAs (e.g., requirements for implementation supports such as PD, site selection criteria, and the collection and use of evaluative feedback), as well as through requirements for grantees to participate in regular cohort conference calls facilitated by MDCC. The communities of practice resulting from these calls enabled grantees to share implementation successes and challenges with colleagues from other projects and exchange ideas and resources for improved implementation. In addition to funding demonstration projects and encouraging the use of effective implementation practices, sponsors can support technical assistance and dissemination to build and spread knowledge on implementation best practices.

One consideration for sponsors is that the content focus of the projects they invest in has implications for how easily high-quality and sustained implementation is achieved, with some interventions being easier to install in real-world settings than others. For example, MDPs implementing progress monitoring in reading instruction saw large-scale sustainment and spread of their models, most likely because their focus was highly aligned with the policy priorities state and local education agencies placed on improving the reading performance of all students as part of the *No Child Left Behind Act of 2002*. Conversely, MDPs with interventions targeted to a relatively small minority of students who exhibited the most serious behavioral challenges at school had more difficulty building deep support for their models within the implementing sites. Furthermore, experience has shown that grantees face significantly greater implementation challenges when their interventions involve crossing system boundaries. For example, grantees implementing models to support youth with disabilities transitioning from the juvenile justice system to the education system experienced significant obstacles as they tried to navigate the regulations, cultures, and approaches to serving at-risk youth between the two systems. Efforts to implement interventions for these populations, particularly those that involve crossing systems boundaries, are critically important, but they are likely to require substantial attention and resources to address complex implementation issues.

Continued research on implementation measures and effective practices will help advance the field of implementation science. Specifically, more work needs to be done to develop high-quality measures of implementation and encourage more systematic use of data from formative evaluation. Many MDPs and technology implementation projects had some high-quality measures, but time and resource constraints made it difficult to incorporate the full range of data and feedback loops that could have benefited their work. Very few, for example, formally assessed fidelity of implementation, that is, the extent to which core implementation strategies such as PD, coaching, and helping sites build administrative supports occurred at the frequency and the quality intended. Furthermore, the challenges of developing valid, reliable, and feasible measures of intervention fidelity have been well documented (Blase & Fixsen, 2013) and suggest the need for more research and support to intervention developers on how to effectively measure intervention fidelity. Finally, research on implementation best practices suggests that intervention developers should carefully assess readiness to help a participating site move from one implementation stage to the next, yet most grantees did not systematically conduct these assessments.

The findings presented in this report demonstrate that with effective implementation strategies and good use of evaluative feedback, MDPs, technology implementation projects, and others can overcome the many challenges of implementing evidence-based practices and tools in real-world dynamic settings such as schools and early childhood and early intervention programs. With high-quality implementation and effective interventions, widespread improvements in important outcomes for children and youth with disabilities are possible.

References

- Aguilar, E. (2013). *The art of coaching: Effective strategies for school transformation*. San Francisco, CA: Jossey-Bass.
- American Psychological Association Task Force on Evidence-Based Practice for Children and Adolescents. (2008). *Disseminating evidence-based practice for children and adolescents: A systems approach to enhancing care*. Washington, DC: American Psychological Association.
- Bagnato, S., Goins, D., Pretti-Frontczak, K., & Neisworth, J. (2014). Authentic assessment as 'best practice' for early childhood intervention: National consumer social validity research. *Topics in Early Childhood Special Education, 34*, 116-127.
- Bagnato, S. J., Neisworth, J. T., & Pretti-Frontczak, K. (2010). *LINKing authentic assessment and early childhood intervention: Best measures for best practices* (2nd ed.). Baltimore, MD: Paul H. Brookes.
- Bandura, A. (2000). Cultivate self-efficacy for personal and organizational effectiveness. In E. A. Locke (Ed.), *Handbook of principles of organization behavior* (pp. 120-136). Oxford, England: Blackwell.
- Bandy, T., Bowie, L., Burkhauser, M., & Metz, A. (2008). *The role of frontline staff in the implementation of evidence-based programs: Report I*. Bethesda, MD: Child Trends. Retrieved from <http://www.childtrends.org/?publications=the-role-of-frontline-staff-in-the-implementation-of-evidence-based-programs-reports-i-and-ii>
- Banilower, E. R., & Shimkus, E. (2004). *Professional development observation study*. Chapel Hill, NC: Horizon Research.
- Barton, D., & Krause, W. (1985). Implementing new technology. *Harvard Business Review, 63*(6), 102-110.
- Benz, M. R., Lindstrom, L., & Latta, T. (1999). Improving collaboration between schools and vocational rehabilitation: The youth transition program model. *Journal of Vocational Rehabilitation, 13*, 55-63.
- Berkel, C., Mauricio, A. M., Schoenfelder, E., & Sandler, I. N. (2010). Putting the pieces together: An integrated model of program implementation. *Prevention Science, 12*, 23-33.
- Bierman, K. L., Sanford DeRousie, R. M., Heinrichs, B., Domitrovich, C. E., Greenberg, M. T., & Gill, S. (2013). Sustaining high-quality teaching and evidence-based curricula: Follow-up assessment of teachers in the REDI Project. *Early Education & Development, 24*, 1194-1213. doi:10.1080=10409289.2013.755457
- Birman, B. F., Desimone, L. M., Porter, A. C., & Garet, M. S. (2000). Designing professional development that works. *Educational Leadership, 57*, 28-33.
- Blase, K. A., & Fixsen, D. L. (2013). *Core intervention components: Identifying and operationalizing what makes programs work*. (ASPE Research Brief). Washington, DC: Office of the Assistant Secretary for Planning and Evaluation, Office of Human Services Policy, U.S. Department of Health and Human Services. Retrieved from http://aspe.hhs.gov/hsp/13/KeyIssuesforChildrenYouth/CoreIntervention/rb_CoreIntervention.cfm

- Blase, K. A., Fixsen, D. L., & Phillips, E. L. (1984). Residential treatment for troubled children: Developing service delivery systems. In S. C. Paine, T. R. Bellamy, & B. Wilcox (Eds.), *Human services that work: from innovation to standard practice* (pp. 149-165). Baltimore, MD: Paul H., Brookes.
- Borko, H. (2004). Professional development and teacher learning: Mapping the terrain. *Educational Researcher*, 33(8), 3-15.
- Botvin, G. J. (2004). Advancing prevention science and practice: Challenges, critical issues, and future directions. *Prevention Science*, 5, 69-72.
- Boyd, S. E., Banilower, E. R., Pasley, J. D., & Weiss, I. R. (2003). *Progress and pitfalls: A cross-site look at local systemic change through teacher enhancement*. Chapel Hill, NC: Horizon Research.
- Bransford, J. D., Brown, A. L., & Cocking, R. R. (2004). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academy Press.
- Breitenstein, S. M., Gross, D., Garvey, C. A., Hil, C. F., L., & Resnick, B. (2010). Implementation fidelity in community-based interventions. *Research in Nursing and Health*, 32(2).
- Briesch, A. M., & Chafouleas, S. M. (2009). Review and analysis of literature on self-management interventions to promote appropriate classroom behaviors (1988-2008). *School Psychology Review*, 24, 106-118.
- Buyse, V., Sparkman, K., & Wesley, P. (2003). Communities of practice: Connecting what we know with what we do. *Exceptional Children*, 69(3), 263-277.
- Carroll, C., Patterson, M., Wood, S., Booth, A., Rick, J., & Balain, S. (2007). A conceptual framework for implementation fidelity. *Implementation Science*, 2-40. doi:10.1186/1748-5908-2-40
- Carroll, R. A., & Peter, C. C. S. (2014). Methods for assessing social validity of behavioral intervention plans for children with Attention Deficit Hyperactivity Disorder. , 4(3), 1642-1656. *Acta de Investigación Psicológica*, 4(3), 1642-1656.
- Carter, S. L. (2010). *The social validity manual: A guide to subjective evaluation of behavior interventions*. Oxford, UK: Elsevier. Oxford, UK: Elsevier.
- Cellini, S. R., & Kee, J. E. (2010). Cost-effectiveness and cost-benefit analysis. In J. S. Wholey, H. P. Hatry, & K. E. Newcomer (Eds.), *Handbook of program evaluation* (3rd ed., pp. 493-530). San Francisco, CA: Jossey-Bass.
- Century, J., Cassata, A., Rudnick, M., & Freeman, C. (2012). Measuring enactment of innovations and the factors that affect implementation and sustainability: moving toward common language and shared conceptual understanding. *Journal of Behavioral Health Services Research*, 39(4), 343-361. doi:10.1007/s11414-012-9287-x
- Century, J., Freeman, C., & Rudnick, M. (2008). *A framework for measuring and accumulating knowledge about fidelity of implementation (FOI) of science instructional materials*. Paper presented at the National Association for Research in Science Teaching Annual Meeting.
- Chinman, M., Imm, P., & Wandersman, A. (2004). *Getting to Outcomes™ 2004: Promoting accountability through methods and tools for planning, implementation, and evaluation* (TR-101-CDC). Santa Monica, CA: RAND. Retrieved from <http://www.rand.org/publications/TR/TR101/>
- Chrispeels, J. H., Brown, J. H., & Castillo, S. (2000). School leadership teams: Factors that influence their development and effectiveness. *Advances in Research and Theories of School Management and Educational Policy*, 4, 39-73.

- Connell, J. P., & Kubisch, A. C. (1998). *Applying a theory of change approach to the evaluation of comprehensive community initiatives: Progress, prospects, and problems*. Retrieved August 27, 2015 from : http://www.seachangecop.org/files/documents/1998_ToC_and_evaluation_of_community_initiatives.pdf.
- Cook, B. G., & Odom, S. L. (2013). Evidence-based practices and implementation science in special education. *Exceptional Children*, 79(2), 135-144.
- Corcoran, T., McVay, S., & Riordan, K. (2003). *Getting it right: The MISE approach to professional development*. Philadelphia, PA: Consortium for Policy Research in Education. Retrieved from <http://files.eric.ed.gov/fulltext/ED498324.pdf>
- Cornett, J., & Knight, J. (2009). Research on coaching. In J. Knight (Ed.), *Coaching: Approaches and perspectives* (pp. 192-216). Thousand Oaks, CA: Corwin Press.
- Damschroder, L. J., Aron, D. C., Keith, R. E., Kirsh, S. R., Alexander, J. A., & Lowery, J. C. (2009). Fostering implementation of health services research findings into practice: A consolidated framework for advancing implementation science. *Implementation Science*, 4, 50. doi:10.1186/1748-5908-4-50
- Dane, A. V., & Schneider, B. H. (1998). Program integrity in primary and early secondary prevention: Are implementation effects out of control? *Clinical Psychology Review*, 18(1), 23-45.
- Darling-Hammond, L., & McLaughlin, M. W. (1995). Policies that support professional development in an era of reform. *Phi Delta Kappan*, 76(8), 597-604.
- Darling-Hammond, L., & Richardson, R. (2009). Teacher learning: What matters? *Educational Leadership*, 66(5), 46-53.
- Darrow, C., Goodson, B., & Boulay, B. (2014). *Universal dimensions of fidelity of implementation*. Paper presented at the American Educational Research Association Annual Meeting, Philadelphia, PA.
- Daunic, A., Smith, S., Brank, E., & Penfield, R. (2006). Classroom-based cognitive-behavioral interventions to prevent aggression: efficacy and social validity. *Journal of School Psychology*, 44, 123-139.
- Dearing, J. W. (2008). Evolution of diffusion and dissemination theory. *Journal of Public Health Management and Practice*, 14(2), 99-108. doi:10.1097/01.PHH.0000311886.98627.b7
- Decker, P., Durand, R., Mayfield, C. O., McCormack, C., Skinner, D., & Perdue, G. (2012). Predicting implementation failure in organization change. *Journal of Organizational Culture, Communications and Conflict*, 16(2), 39-60.
- Deno, S. L. (2003). Developments in curriculum-based measurement. *The Journal of Special Education*, 37(3), 184-192.
- Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward better conceptualizations and measures. *Educational Researcher*, 38(3), 181-199.
- Desimone, L. M., Smith, T., & Frisvold, D. (2007). Is NCLB increasing teacher quality for students in poverty? In A. Gamoran (Ed.), *Standards-based and the poverty gap: Lessons from No Child Left Behind* (pp. 89-119). Washington, DC: Brookings Institution Press.
- DuBois, D. L., Holloway, B. E., Valentine, J. C., & Cooper, H. (2002). Effectiveness of mentoring programs for youth: A meta-analytic review. *American Journal of Community Psychology*, 30(2), 157-197.

- DuFour, R. (2004). What is a "professional learning community?". *Educational Leadership*, 63(8), 6-11.
- Dumas, J. E., Lynch, A. M., Laughlin, J. E., Smith, E. P., & Prinz, R. J. (2001). Promoting intervention fidelity: Conceptual issues, methods, and preliminary results from the EARLY ALLIANCE prevention trial. *American Journal of Preventive Medicine*, 20, 39-47.
- Dunst, C. J., & Trivette, C. M. (2009). Let's be PALS: An evidence-based approach to professional development. *Infants and Young Children*, 22(3), 164-176.
doi:10.1097/IYC.0b013e3181abe169
- Dusenbury, L., Brannigan, R., Falco, M., & Hansen, W. B. (2003). A review of research on fidelity of implementation: Implications for drug abuse prevention in school settings. *Health Education Research Theory and Practice*, 18(2), 237-256. doi:10.1093/her/18.2.237
- Dworkin, S. L., Pinto, R. M., Hunter, J., Rapkin, B., & Remien, R. H. (2008). Keeping the spirit of community partnerships alive in the scale up of HIV/AIDS prevention: Critical reflections on the rollout of DEBI (Diffusion of Effective Behavioral Interventions). *American Journal of Community Psychology*, 42, 51-59.
- Eames, C., Daley, D., Hutchings, J., Hughes, J. C., Jones, K., Martin, P., & Bywater, T. (2008). The Leader Observation Tool: A process skills treatment fidelity measure for the Incredible Years parenting programme. *Child: Care, Health and Development*, 34, 391-400.
- Eccles, M. P., & Mittman, B. S. (2006). Welcome to implementation science. *Implementation Science*, 1(1), 1-3.
- Elias, M. J., Zins, J. E., Graczyk, P. A., & Weissberg, R. P. (2003). Implementation, sustainability, and scaling up of social-emotional and academic innovations in public schools. *School Psychology Review*, 32(3), 303-319.
- Elliott, D. S., & Mihalic, S. (2004). Issues in disseminating and replicating effective prevention programs. *Prevention Science*, 5(1), 47-54.
- Elliott, S. N. (1988). Acceptability of behavioral treatments in educational settings. In J.C. Witt, S.N. Elliott, & E. M. Gresham (Eds.), *Handbook of behavioral therapy in education* (pp. 121-150). New York, NY: Picnum.
- Englert, C. S., & Tarrant, K. L. (1995). Creating collaborative cultures for educational change. *Remedial and Special Education*, 16(6), 325-336.
- Fagen, M. C., & Flay, B. R. (2006). Sustaining a school-based prevention program: Results from the Aban Aya sustainability project. *Health Education & Behavior*, 36(2), 9-23.
- Feldstein, A. C., & Glasgow, R. E. (2008). A practical, robust implementation and sustainability model (PRISM) for integrating research findings into practice. *Joint Commission Journal on Quality and Patient Safety*, 34(4), 228-243.
- Fixsen, D. L., Blase, K. A., Horner, R., & Sugai, G. (2009a). Readiness for change. Scaling-up brief #3. *State Implementation & Scaling-up of Evidence-based Practices*, (3).
http://www.fpg.unc.edu/~sisep/docs/SISEP_Brief_3_Readiness_2009.pdf
- Fixsen, D. L., Blase, K. A., Naoom, S. F., & Wallace, F. (2009b). Core implementation components. *Research on Social Work Practice*, 19(5), 531-540.
doi:10.1177/1049731509335549
- Fixsen, D. L., Naoom, S. F., Blase, K. A., Friedman, R. M., & Wallace, F. (2005). *Implementation research: A synthesis of the literature*. Tampa: National Implementation Research Network, University of South Florida.

- Forgatch, M. S., Patterson, G. R., & DeGarmo, D. S. (2005). Evaluating fidelity: Predictive validity for a measure of competent adherence to the Oregon model of parent management training. *Behavior Therapy*, 36, 3-13.
- Foster, S. L., & Mash, E. J. (1999). Assessing social validity in clinical treatment research: Issues and procedures. *Journal of Consulting and Clinical Psychology*, 67(3), 308-319.
- Franklin, C., & Hopson, L. (2004). Into the schools with evidence-based practices. *Children & Schools*, 26(1), 67-70.
- Gansle, K. A., & Noell, G. H. (2007). The fundamental role of intervention implementation in assessing response to intervention. In S. R. Jimerson, M. K. Burns, & A. M. Vanderhyden (Eds.), *Handbook of response to intervention* (pp. 244-251). New York, NY: Springer.
- Glennan, T. K., Bodily, S. J., Galegher, J. R., & Kerr, K. A. (2004). *Expanding the reach of education reforms: Perspectives from leaders in the scale-up of educational interventions*. Santa Monica, CA: RAND.
- Glisson, C., Landsverk, J., Schoenwald, S., Kelleher, K., Hoagwood, K. E., Mayberg, S., & Green, P. (2005). Assessing the organizational social context (OSC) of mental health services: Implications for research and practice. *Administration and Policy in Mental Health and Mental Health Services Research*, 35, 98-113.
- Global Implementation Initiative. (2015). Retrieved from <http://globalimplementation.org/>
- Graner, P. S., Ault, M. M., Mellard, D. F., & Gingerich, R. A. (2012). *White paper surfacing research-based elements for professional development*. Retrieved from <https://kuecprd.ku.edu/~kucrl/cgi-bin/white-paper-effective-professional-development-for-adult-learners.html>
- Greenberg, M. T., Domitrovich, C. E., Graczyk, P. A., & Zins, J. E. (2005). *The study of implementation in school-based preventive interventions: Theory, research, and practice*. Rockville, MD: Center for Mental Health Services, Substance Abuse and Mental Health Services Administration.
- Greenhalgh, T., Robert, G., MacFarlane, F., Bate, P., & Kyriakidou, O. (2004). Diffusion of innovations in service organizations: Systematic review and recommendations. *Milbank Quarterly*, 82(4), 581-629. doi:10.1111/j.0887-378X.2004.00325.x
- Guskey, T. (2000). *Evaluating professional development*. Thousand Oaks, CA: Corwin Press.
- Guskey, T. R., & Yoon, K. S. (2009). *What works in professional development?* Retrieved from <http://www.k12.wa.us/Compensation/pubdocs/Guskey2009whatworks.pdf>
- Hall, G., Dymnnicki, A., Coffey, J., & Brodowski, M. (2014). *Using evidence-based constructs to assess extent of implementation of evidence-based interventions*. Washington, DC: Office of the Assistant Secretary for Planning and Evaluation.
- Hall, G., & Hord, S. (2011). *Implementing change: Patterns, principals, and potholes* (3rd ed.). Boston, MA: Allyn and Bacon.
- Hall, G. E., & Hord, S. M. (2015). *Implementing change: Patterns, principles and potholes* (4th ed.). Upper Saddle River, NJ: Pearson.
- Halle, T., Metz, A., & Martinez-Beck, I. (Eds.). (2013). *Applying implementation science in early childhood programs and systems*. Baltimore, MD: Brookes.
- Han, S. S., & Weiss, B. (2005). Sustainability of teacher program implementation of school-based mental health programs. *Journal of Abnormal Child Psychology*, 33(6), 665-679.

- Harn, B., Parisi, D., & Stoolmiller, M. (2013). Balancing fidelity with flexibility and fit: What do we really know about fidelity of implementation in schools? *Exceptional Children*, 79(2), 181-193.
- Hogue, A., Henderson, C. E., Dauber, S., Barajas, P. C., Fried, A., & Liddle, H. A. (2008). Treatment adherence, competence, and outcome in individual and family therapy for adolescent behavior problems. *Journal of Consulting and Clinical Psychology*, 76, 544-555.
- Honig, M. I., & Coburn, C. E. (2008). Evidence-based decision-making in school district central offices: Toward a research agenda. *Educational Policy*, 22(4), 578-608.
doi:10.1177/0895904807307067
- Horner, R. H., Blitz, C., & Ross, S. W. (2014). *The importance of contextual fit when implementing evidence-based interventions*. Washington, DC: Office of the Assistant Secretary for Planning and Evaluation, Office of Human Services Policy, U.S. Department of Health and Human Services.
- Hummel-Rossi, B., & Ashdown, J. (2002). The state of cost-benefit and cost-effectiveness analyses in education. *Review of Educational Research*, 71(1), 1-30.
- Ingram, D., Seashore Lewis, K. R., & Schroeder, R. (2004). Accountability policies and teacher decision making: Barriers to the use of data to improve practice. *Teachers College Record*, 106(6), 1258-1287.
- James Bell Associates. (2008). *Evaluation brief: Conducting a process evaluation*. Arlington, VA: Author.
- Joyce, B., & Showers, B. (2002). *Student achievement through staff development* (3rd ed.). Alexandria, VA: Association for Supervision and Curriculum Development.
- Knight, J. (2007). *Instructional coaching: A partnership approach to improving instruction*. Thousand Oaks, CA: Corwin Press.
- Knowles, M. (1998). *The adult learner: The definitive classic in adult education and human resource development* (5th ed.). Houston, TX: Gulf.
- Lauer, P. A., Snow, D., Martin-Glenn, M., Van Buhler, R. J., Stoutemyer, K., & Snow-Renner, R. (2005). *The influence of standards on K-12 teaching and student learning: A research synthesis*. Denver, CO: MCREL. Retrieved from http://www.mcrel.org/~media/Files/McREL/Homepage/Products/01_99/prod68_PD_analysis.ashx
- Lee, S. J., Altschul, I., & Mawbray, C. T. (2008). Using planned adaptation to implement evidence-based programs with new populations. *American Journal of Community Psychology*, 41, 290-303.
- Levin, H. M., & McEwan, P. J. (2001). *Cost-effectiveness analysis: Methods and applications* (2nd ed.). Thousand Oaks, CA: Sage.
- Levine, S., & Broude, N. (1989). Designs for learning. In S. Caldwell (Ed.), *Staff development: A handbook of effective practices*. Oxford, OH: National Staff Development Council.
- Lillehoj, C. J., Griffin, K. W., & Spoth, R. (2004). Program provider and observer ratings of school-based preventive intervention and implementation: Agreement and relation to youth outcomes. *Health Education and Behavior*, 31, 242-257.
- Little, J. W., Gearhart, M., Curry, M., & Kafka, J. (2003). Looking at student work for teacher learning, teacher community, and school reform. *Phi Delta Kappan*, 85(3), 185-192.
- Lloyd, C. M., & Bangser, M. (2009). *Promoting preschool quality through effective classroom management: Implementation lessons from the Foundations of Learning Demonstration*. New York, NY: MDRC.

- Loucks-Horsley, H., P. W., Love, N., & Stiles, K. (1998). *Designing professional development for teacher of science and mathematics*. Thousand Oaks, CA: Corwin Press.
- Marchant, M., Heath, M., & Miramontes, N. (2012). Merging empiricism and humanism: Role of social validity in the school-wide positive behavior support model. *Journal of Positive Behavior Interventions*, 14(4), 221-230.
- Marshall, C., & Rossman, G. B. (2011). *Designing qualitative research (5th ed.)*. Thousand Oaks, CA: Sage.
- McLaughlin, M. (1990). The RAND Change Agent Study revisited: Macro perspectives and micro realities. *Educational Researcher*, 19(9), 11-16.
- Merriam, S. B., & Bierema, L. L. (2014). *Adult learning: Linking theory and practice*. San Francisco, CA: Jossey-Bass.
- Merriam, S. B., & Caffarella, R. S. (1999). *Learning in adulthood*. San Francisco, CA: Jossey-Bass.
- Metz, A. (2015). The potential of co-creation in implementation science. *Implementation Brief*. <http://nirn.fpg.unc.edu/sites/nirn.fpg.unc.edu/files/resources/NIRN-Metz-ImplementationBrief-CoCreation.pdf>
- Meyers, D. C., Durlak, J., & Wandersman, A. (2012). The quality implementation framework: A synthesis of critical steps in the implementation process. *American Journal of Community Psychology*, 50(462-480).
- Michie, S., Fixsen, D., Grimshaw, J., & Eccles, M. (2009). Specifying and reporting complex behavior change interventions: The need for a scientific method. *Implementation Science*, 4(1), 40. doi:10.1186/1748-5908-4-40
- Mihalic, S. (2004). The importance of implementation fidelity. *Emotional and Behavioral Disorders in Youth*, 4, 83-86.
- Mowbray, C. T., Holter, M. C., Teague, G. B., & Bybee, D. (2003). Fidelity criteria: Development, measurement, and validation. *American Journal of Evaluation*, 24(3), 315-340.
- National Comprehensive Center for Teacher Quality. (2010). *Conducting a cost analysis for educational policies: Teacher effectiveness*. Washington, DC: U.S. Department of Education.
- National Implementation Research Network. (2015). *Usable interventions*. Chapel Hill, NC: Author. Retrieved from <http://implementation.fpg.unc.edu/module-6>
- National Implementation Research Network (Producer). (n.d.-a). The Active Implementation Hub. Lesson 3: Practice Profiles.
- National Implementation Research Network. (n.d.-b). *Research on Facilitative Administration*. Chapel Hill, NC: Author.
- Nilsen, P. (2015). Making sense of implementation theories, models and frameworks. *Implementation Science*, 10:53(53). doi:10.1186/s13012-015-0242-0
- Noonan, P. M., Morningstar, M. E., & Erickson, A. G. (2008). Improving interagency collaboration: Effective strategies used by high-performing local districts and communities. *Career Development for Exceptional Individuals*, 31(3), 132-143. doi:10.1177/0885728808327149
- O'Donnell, C. (2008). Defining, conceptualizing, and measuring fidelity of implementation and its relationship to outcomes in K-12 curriculum intervention research. *Review of Educational Research*, 78(1), 33-84. doi:10.3102/0034654307313793

- Office of Special Education and Rehabilitative Services. (2012a). Technology and media services for individuals with disabilities: Models promoting young children's use of assistive technology. *Federal Register*, 77(107), 32952-32959.
- Office of Special Education and Rehabilitative Services. (2012b). Technology and media services for individuals with disabilities: Stepping-Up Technology Implementation. *Federal Register*, 77(98), 29989-29995.
- Office of Special Education and Rehabilitative Services. (January 9, 2014). Applications for new awards: Educational technology, media, and materials for individuals with disabilities--Stepping-Up Technology Implementation. Notice. *Federal Register*, 79(6), 1636.
- Office of Special Education Programs. (2009). Technical assistance and dissemination to improve services and results for children with disabilities-Model demonstration projects on tiered approaches for improving the writing proficiency of high school students. *Federal Register*, 74(132), 33418-33424.
- Office of Special Education Programs. (2011). Technical assistance and dissemination to improve services and results for children with disabilities--Model Demonstration Projects for English learners with or at risk of having a disability. *Federal Register*, 76, 50462-50470.
- Parsons, M. B., Rollyson, J. H., & Reid, D. H. (2012). Evidence-based staff training: A guide for practitioners. *Behavior Analysis in Practice*, 5(2), 2-11.
- Patton, M. Q. (2008). *Utilization focused evaluation*. 4th ed. Thousand Oaks, CA: Sage Publications.
- Perepletchikova, F., & Kazdin, A. E. (2005). Treatment integrity and therapeutic change: Issues and research recommendations. *Clinical Psychology: Science and Practice*, 12(4), 365-383.
- Perepletchikova, F., Treat, T. A., & Kazdin, A. E. (2007). Treatment integrity in psychotherapy research: Analysis of the studies and examination of the associated factors 2007;75:829-841. *Journal of Consulting and Clinical Psychology*, 75, 829-841.
- Poplin, C. (2003). Models of professional development. *THE Journal (Technological Horizons in Education)*, 30(11).
- Proctor, E. K., Landsverk, J., Aarons, G., Chambers, D., Glisson, C., & Mittman, B. (2009). Implementation research in mental health services: An emerging science with conceptual, methodological, and training challenges. *Administration and Policy in Mental Health and Mental Health Services Research*, 36(1), 24-34. doi:10-1067/s10488-008-0197-4
- Raver, C., Jones, S. M., Li-Grinning, C. P., Metzger, M., Champion, K. M., & Sardin, L. (2008). Improving preschool classroom processes: Preliminary findings from a randomized trial implemented in Head Start settings. *Early Childhood Research Quarterly*, 23(1), 10-26.
- Repenning, N. P. (2002). A simulation-based approach to understanding the dynamics of innovation implementation. *Organization Science*, 13(2), 109-127.
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York, NY: Free Press.
- Ross, J. A., & Bruce, C. D. (2007). Teacher self-assessment: A mechanism for facilitating professional growth. *Teaching and Teacher Education*, 23(2), 146-159.
- Rynes, S. L., Bartunek, M. J., & Daft, R. L. (2001). Across the great divide: Knowledge creation and transfer between practitioners and academics. *Academy of Management*, 44(2), 340-355.
- Santangelo, T. (2009). Collaborative problem solving effectively implemented, but not sustained: A case for aligning the sun, the moon, and the stars. *Exceptional Children*, 75, 185-209.
- Saunders, R. P., Evans, M. H., & Joshi, P. (2005). Developing a process-evaluation plan for assessing health promotion program implementation: a how-to guide. *Health Promotion Practice*, 6(2), 134-147.

- Schofield, J. (2004). A model of learned implementation. *Public Administration*, 82, 283-308.
- Schwartz, I. S., & Baer, D. M. (1991). Social validity assessments: Is current practice state of the art? *Journal of Applied Psychology*, 24(2), 189-204. doi:10.1901/jaba.1991.24-189
- Shaver, D., Lenz, K., Wagner, M., & Greene, S. (2015). *Planning for replication and dissemination from the start: Guidelines for Model Demonstration Projects*. Menlo Park, CA: SRI International.
- Shaver, D., & Wagner, M. (2013). *Preparing for model demonstration implementation*. Menlo Park, CA: SRI International.
- Shaver, D., Wagner, M., & Lenz, K. (2011). *Assessing sites for model demonstration: Lessons learned from OSEP grantees*. Menlo Park, CA: SRI International.
- Shediak-Rizkallah, M. C., & Bone, L. R. (1998). Planning for the sustainability of community-based health programs: Conceptual frameworks and future directions for research, practice, and policy. *Health Education Research*, 13, 87-108.
- Sheridan, S. M., Pope-Edwards, C., Marvin, C. A., & Knoche, L. L. (2009). Professional development in early childhood programs: Process issues and research needs. *Early Education & Development*, 20(3), 377-401.
- Shonkoff, J. P., & Bales, S. N. (2011). Science does not speak for itself: Translating child development research for the public and its policymakers. *Child Development*, 81(1), 17-32.
- Spillane, J. P. (2012). Data in practice: Conceptualizing the data-based decision-making phenomenon. *American Journal of Education*, 118(2), 113-141.
- Stoll, L., Bolam, R., McMahon, A., Wallace, M., & Thomas, S. (2006). Professional learning communities: A review of the literature. *Journal of Educational Change*, 7, 221-258.
- Stringfield, S., Reynolds, D., & Schaffer, E. (2001). *Fifth-year results from the High Reliability Schools project*. Paper presented at the Annual meeting of the International Congress for School Effectiveness and Improvement, Toronto, Ontario, Canada.
- Supplee, L. H., & Metz, A. (2015). *Opportunities and challenges in evidence-based social policy*. Chapel Hill, NC: Society for Research in Child Development. Retrieved from http://www.srcc.org/sites/default/files/documents/spr_28_4.pdf
- Thompson, S. C., Gregg, L., & Niska, J. M. (2004). Professional learning communities, leadership, and student learning. *Research in Middle Level Education Online*, 28(1), 1-15.
- Thoms, K. J. (2001). *They're not just big kids: Motivating adult learners*. Paper presented at the Annual Mid-South Instructional Technology Conference, Murfreesboro, TN.
- Turan, Y., & Meadan, H. (2011). Social validity assessment in early childhood special education. *Young Exceptional Children Monograph Series*, 14(3), 13-28.
- Van Houten, R. (1979). Social validation: The evolution of standards of competency for target behaviors. , 12, 581-591. *Journal of Applied Behavior Analysis*, 12(581-591).
- Vescio, V., Ross, D., & Adams, A. (2008). A review of research on the impact of professional learning communities on teaching practice and student learning. *Teaching and Teacher Education*, 24, 80-91.
- Wagner, M., Lenz, K., & Shaver, D. (2011). *Progress monitoring interventions for elementary school reading: Lessons learned about model sustainability and spread*. Menlo Park, CA: SRI International. Retrieved from http://mdcc.sri.com/documents/MDCC_C1_Followup_OCT2011.pdf
- Wagner, M., & Shaver, D. (2015). *Sustainment of model demonstration projects: Findings from follow-up Studies*. Menlo Park, CA: SRI International.

- Webster-Wright, A. (2009). Reframing professional development through understanding authentic professional learning. *Review of Educational Research*, 79(2), 702-739.
- Weiss, C. H. (1972). *Evaluation research: Methods of assessing program effectiveness*. Englewood Cliffs, NJ: Prentice-Hall.
- White, J. L., Albers, C. A., DePerna, J. C., Elliott, S. N., Kratochwill, T. R., & Roach, A. T. (2005). *Cost analysis in educational decision making: Approaches, procedures, and case examples*. Madison: University of Wisconsin, Wisconsin Center for Education Research Coordination, Consultation, & Evaluation.
- Winter, S. G., & Szulanski, G. (2001). Replication as strategy. *Organization Science*, 12(6), 730-743.
- Wolf, M. M. (1978). Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart. , 11, 203-214. *Journal of Applied Behavior Analysis*, 11, 203-214.
- Wolf, M. M., Kirigin, K. A., Fixsen, D. L., Blase, K. A., & Braukmann, C. J. (1995). The Teaching-Family Model: A case study in data-based program development and refinement (and dragon wrestling). *Journal of Organizational Behavior Management*, 15, 11-68.
- Yoon, K. S., Duncan, T., Lee, S. W.-Y., Scarloss, B., & Shapley, K. L. (2007). *Reviewing the evidence on how teacher professional development affects student achievement* (Issues & Answers Report REL 2007–No. 033). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Southwest. Retrieved from <http://ies.ed.gov/ncee/edlabs>

Appendix A

MDCC Background: Evaluation Questions, Data Sources, Methods, and Products

MDCC Background

This appendix provides an overview of the major features of MDCC—the evaluation questions addressed, the data sources used, the analysis methods used, and the products that resulted from this work.

Evaluation Questions

Guided by the conceptual framework presented in Chapter 1, MDCC developed a three-level set of evaluation questions. Level 1 questions were specific to each grantee within a cohort and were suitable for analyses at the grantee level. Level 2 questions pertained to the process of developing and implementing models or a technology tool across the grantees within a cohort. For the first four cohorts, MDCC was responsible for synthesizing cohort-level findings and addressing level 2 questions in cohort reports. Level 3 questions were those MDCC addressed using data from across the cohorts. The implementation strategies presented in this report stem from findings concerning the questions in boldface in Table A-1, which addressed how differences in core intervention components, implementation strategies, and participating destination organizations and their external environments related to high-quality and sustained implementation and improved outcomes for children, youth, families, organizations, or systems.

Data Sources

MDCC drew on a variety of data sources in analyzing the interventions, experiences, and implementation and intervention outcomes of OSEP’s model demonstration and technology implementation grantees, as described below.

Qualitative Templates

The descriptive findings reported here were compiled mainly from qualitative data, largely taken from the following sources:

- **Project Templates.** These templates, completed by both MDP and technology implementation grantees, recorded the story of the implementation process during each year of their grants. The grantees documented how project teams learned and how evidence and experience were used to iterate the details and procedures of the models and technology tools. They were completed by grantee staff members in sections as the projects evolved and addressed such topics as site selection, preparation to work with sites, implementation in each year, revisions to the model or tool, and factors that influenced implementation.
- **Grantee proposals.** The narrative section of the grantees’ applications for awards described the components of the model or features of the technology tool, provided background information on the proposed sites, and set forth technical information on the models proposed.
- **Conference call notes.** Notes documented each grantee’s update report during regularly scheduled conference calls with MDCC and OSEP project officers.

Table A-1. MDCC Level 3 (Cross-Cohort) Evaluation Questions

Core Intervention Components
<p>1a. How do the core intervention components of the models differ?</p> <p>1b. How do differences in core intervention components relate to the models' perceived</p> <ul style="list-style-type: none"> • Relative advantage? • Complexity? • Compatibility with the destination organization and contextual environment • Social validity? <p>1c. How do differences in core intervention components relate to the fullness/fidelity of model implementation and to establishing conditions supportive of sustainment?</p>
Implementation Strategies
<p>2a. How do models differ with regard to</p> <ul style="list-style-type: none"> • Strategies for recruiting destination organizations and introducing models? • Professional development approaches? • Approaches to ongoing support for implementers and administrators/stakeholders? • Staffing strategies? • Ways of learning from implementation experiences and adapting core intervention components and implementation strategies? <p>2b. How do differences in implementation strategies relate to the fullness/fidelity of model implementation and to establishing conditions supportive of sustainment?</p>
Destination Organizations
<p>3a. How do host organizations differ with regard to key characteristics (e.g., children/families served, history with model-related practices, support for the model, staff and leadership, resources relevant to model, organizational functioning, climate, and culture)?</p> <p>3b. How do organizations differ with regard to implementation outcomes—their ability to change the following in support of implementation with fidelity and the potential sustainment:</p> <ul style="list-style-type: none"> • Staff knowledge, attitudes, and actions/behavior? • Organizational structures, processes, and culture? • External relationships? <p>3c. How do differences in organizational characteristics relate to implementation outcomes?</p>
External Influences
<p>4a. How do destination organizations differ with regard to external influences (e.g., district and/or state support and resources for/alignment with model, circumstances/authorities that exert some control over implementation and/or sustainment)?</p> <p>4b. How do differences in external influences relate to the fullness and fidelity of model implementation and to establishing conditions supportive of sustainment?</p>
Outcomes
<p>5a. How do models and destination organizations differ with regard to individual- and systems-level outcomes?</p> <p>5b. How do differences in core intervention components, implementation strategies, destination organizations, and external influences relate to differences in implementation and intervention outcomes?</p>

MDPs in some cohorts also provided data from the **Model Specification Template**, which documented the specific features and design elements of their models (e.g., evidence-based core instructional components, universal screening, interventions of varying levels of intensity). Cohorts that completed their projects during MDCC's years working with them revised their templates at the end of implementation to reflect any changes to the models made on the basis of their implementation. MDPs that worked in schools or school districts also completed the following data collection tools:

- **MDP District and School Profile Tools.** MDP staff members used these qualitative tools to describe the district and school contexts within which they were implementing their models. Each tool had an overview section that set the stage for understanding the district, school, or classroom (e.g., type of school, academic performance standing). Each also had a section on experience with and support for the intervention. District and school templates described staffing and leadership, as well as the special education context. The School Profile Tool also documented schools' professional development opportunities, technology capabilities, and instructional approaches.
- **School and classroom surveys.** MDPs collected information on the school population, characteristics of teachers participating in the model, and characteristics of students receiving the tiered writing interventions.
- **Common Core of Data (CCD).** This U.S. Department of Education database contains such items as the student enrollment at the school, the racial/ethnic distribution of the student body, the student-teacher ratio, and percentage of students eligible for free or reduced-price lunch. The database was used to augment contextual information from the profile tools, templates, and surveys.

Grantees in cohort 3, which focused on models to teach parents of infants and toddlers with disabilities or developmental delays strategies for working with their children to improve their language acquisition, also provided data from a **Transition Template**. This was a qualitative tool for describing the characteristics of the models and implementation processes that promoted continuity of services from Part C to Part B and better transitions. An **Early Intervention Services Profile Tool** described the context within which MDPs were implementing their early childhood language intervention models. A **Part C Program Services Survey** and **coach and provider surveys** were used to quantify aspects of the Part C delivery system and to gather information about the education, training, and demographic characteristics of the staff who implemented the MDP interventions.

The following forms of data also were provided by grantees in some MDP cohorts:

- **Fidelity and social validity data.** To assess these two aspects of implementation, MDP developed and administered instruments that were appropriate to its particular model and submitted the resulting data to MDCC.
- **Outcome measures.** MDPs collected data on common outcomes, such as reading or writing proficiency, as well as MDP-specific measures.
- **Other MDP materials and resources.** Newsletters, websites, written project updates, and other MDP-related materials provided additional sources of information.

Methods

The text-based responses provided on the profile tools and various templates were extremely valuable in identifying variations in core intervention and implementation components of the models and technology tools and for examining the relationships between these variations and differences in implementation outcomes. For the first four cohorts of MDPs, which concluded their work in 2008, 2009, 2011, and 2013, MDCC staff²⁰ wrote comprehensive reports based on the qualitative data from the various templates and other sources described above and quantitative data on fidelity and child outcomes. For the first three cohorts of MDPs, OSEP, through MDCC, also commissioned grantee leaders to revisit their project sites to assess the extent to which the model had been sustained there and had spread to other sites.²¹ The findings from these initial cohorts were used extensively in the analyses reported here.

Other cohorts did not complete their work in time for MDCC to fully analyze and report on their implementation experiences and outcomes. For those cohorts, as for those reported earlier, MDCC staff read data for all cases and engaged in analysis of the themes that emerged, a process developed and refined at SRI.²² In this type of analysis, propositions are generated about a particular topic, and then the cases are used to refute, support, or restate each proposition. MDCC staff also inventoried the range of factors that implementation science research posits to be related to more successful implementation. Through an inductive process, grantees' experiences and the related research findings were distilled and those related to the topics addressed here were culled, including developing core intervention components, building staff and organizational capacity, and obtaining and using evaluative feedback data.

Products

MDCC has hosted a website since its inception where the MDCC reports have been made publicly available. These are the following:

Gaylor, E., Wagner, M., Shaver, D., Fabrikant, N., & Hebbeler, K. (2013). *Early childhood language interventions: An illustration of the model demonstration process. Project findings in brief*. Menlo Park, CA: SRI International. Retrieved from http://mdcc.sri.com/documents/MDCC_C3_ProjectBrief_DEC2013r1.pdf

Shaver, D., Lenz, K., Wagner, M., & Greene, S. (2015). *Planning for replication and dissemination from the start: Guidelines for Model Demonstration Projects*. Menlo Park, CA: SRI International. Retrieved from http://mdcc.sri.com/documents/MDCC_ReplicationBrief_SEP2015.pdf

Shaver, D., & Wagner, M. (2013). *Preparing for model demonstration implementation*. Menlo Park, CA: SRI International. Retrieved from http://mdcc.sri.com/documents/MDCC_PreparationStage_Brief_Apr2013.pdf

Shaver, D., Wagner, M., & Greene, S. (2015). *Tiered writing interventions for secondary school students. Project findings in brief*. Menlo Park, CA: SRI International. Retrieved from http://mdcc.sri.com/documents/MDCC_C4_ProjectBrief_MAY2015.pdf

²⁰ Gaylor, Wagner, Shaver, Fabrikant, & Hebbeler, 2013; Shaver, Wagner, & Greene, 2015; Wagner & Levine, 2010; Yu, Wagner, Levine, & Petersen, 2011.

²¹ Wagner, Gaylor, Fabrikant, & Shaver, 2013; Wagner, Lenz, & Shaver, 2011; Yu, Wagner, & Shaver, 2012.

²² Greene, D., & David, J. L. (1984). A research design for generalizing from multiple case studies. *Evaluation and Program Planning*, 7, 73-85.

- Shaver, D., Wagner, M., & Lenz, K. (2011). *Assessing sites for model demonstration: Lessons learned from OSEP grantees*. Menlo Park, CA: SRI International. Retrieved from http://mdcc.sri.com/documents/MDCC_Site_Assessment_Brief_09-30-11.pdf
- Wagner, M., Gaylor, E., Fabrikant, N., & Shaver, D. (2013). *Early childhood language intervention models: Lessons learned about model sustainment and spread*. Menlo Park, CA: SRI International. Retrieved from http://mdcc.sri.com/documents/MDCC_C3_ECLanguageInterventions_DEC2013r1.pdf
- Wagner, M., Gaylor, E., Hebbeler, K., Lenz, K., Levine, P., & Yu, J. (2010). *The Model Demonstration Coordination Center: Final report of the first 5 years*. Menlo Park, CA: SRI International. Retrieved from http://mdcc.sri.com/documents/MDCC-First_Five_Years-Final_Report_30Sept2010.pdf
- Wagner, M., Lenz, K., & Shaver, D. (2011). *Progress monitoring interventions for elementary school reading: Lessons learned about model sustainability and spread*. Menlo Park, CA: SRI International. Retrieved from http://mdcc.sri.com/documents/MDCC_C1_Followup_OCT2011.pdf
- Wagner, M., & Levine, P. (2009). *The Model Demonstration Coordination Center: Reflections on the first four years*. Menlo Park, CA: SRI International. Retrieved from <http://mdcc.sri.com/documents/MDCC-Reflections%20on%20the%20first%204%20years-10Dec09.pdf>
- Wagner, M., & Levine, P. (2010). *Progress monitoring interventions for elementary school reading: An illustration of the model demonstration process*. Menlo Park, CA: SRI International. Retrieved from http://mdcc.sri.com/documents/MDCC_Cohort1_ProjectBrief_SEP2010.pdf
- Wagner, M., & Shaver, D. (2015). *Sustainment of model demonstration projects: Findings from follow-up Studies*. Menlo Park, CA: SRI International. Retrieved from http://mdcc.sri.com/documents/MDCC_SustainmenBrief_AUG2015.pdf
- Yu, J., Wagner, M., Levine, P., & Petersen, D. (2011). *Tertiary behavior intervention models in elementary and middle schools*. Menlo Park, CA: SRI International. Retrieved from http://mdcc.sri.com/documents/MDCC_C2_Sept2011-ProjectBrief_051812av.pdf
- Yu, J., Wagner, M., & Shaver, D. (2012). *Tertiary behavior intervention models in elementary and middle schools: Lessons learned about model sustainability and spread*. Menlo Park, CA: SRI International. Retrieved from http://mdcc.sri.com/documents/MDCC_C2_Followup_OCT2012.pdf

MDCC staff members also have presented information about MDCC and its implementation research findings to a variety of groups:

Shaver, D., & Wagner, M. (2015, June). *Sustainment in model demonstration projects*. A webinar presented online with the sponsorship of the OSEP Technical Assistance Coordination Center.

- Wagner, M. (2015, May). *From model demonstration to sustained implementation of evidence-based practices*. Presentation to the OSEP-sponsored Leveraging Resources Conference, Washington, DC.
- Gonzalez, P., Shaver, D., Shapiro, E., Robinson, S., & Wagner, M. (2013, July). *From model demonstration to sustained implementation of evidence-based practices*. Panel discussion presented at the OSEP Project Directors' Meeting, Washington, DC.
- Wagner, M., & Levine, P. (2009). *Learning from model demonstration projects: An example*. Briefing to the U.S. Office of Special Education Programs, Washington, DC.

Appendix B

MDCC Synthesis of Factors Influencing Implementation

Factors Influencing Implementation

The factors identified in Table B-1 as either supporting or hindering implementation or sustainment of model demonstration projects or technology implementation tools were mentioned in Project Templates or other sources by one or more grantees as being pertinent to their implementation experiences in one or more of their sites. The inclusion of a factor in the table does not imply that it was found to be related to implementation in all or even a majority of sites. Rather, the table includes the range of factors that can come into play in understanding implementation experiences. The factors listed are nonduplicative.

Table B-1. Factors Found to Support or Hinder Implementation or Sustainment of Model Demonstration and/or Technology Implementation Projects

Factors related to:	Relationship of factors to ease or quality of implementation or sustainment
<p>Intervention components: features of the intervention or tool such as instructional components, data-based decisionmaking (if it is part of model/tool), technical components.</p>	<p>Supported implementation or sustainment</p> <ul style="list-style-type: none"> • Having one or more intervention components already in place (e.g., primary-level PBIS in a tertiary behavior intervention cohort). • Using data-driven screening processes and progress monitoring to identify students who require more intensive supports or to determine the intervention needed. Interventions with progress monitoring systems also supported iterative modification of the intervention. • Web-based progress monitoring systems, which reduced burden on staff and facilitated the use of data for decisionmaking. • Having a well-structured and defined data meeting component to assess student progress and identify student needs. • Interventions that were aligned with local priorities and programs. • Intervention components that placed relatively small demand on staff members' time. • Using a multidisciplinary team approach to individualize interventions to children's needs. • Providing intervention products and tools to support implementation. • Having flexible intervention components. <p>Hindered implementation or sustainment</p> <ul style="list-style-type: none"> • Tiered interventions, which were difficult to implement in high schools (e.g., scheduling and staffing challenges). • Complexity of the intervention, which sometimes, but not always, hindered implementation. • Intervention components that involved participants (e.g., parents) at night, which hindered participation because of needs for childcare. • Misalignment with the site culture, staff members' beliefs, and child needs/abilities. • The home-based nature of some of the early childhood interventions, which made transitioning them to Part B center-based settings difficult. • Components that intersected with heavily regulated aspects of the education system (e.g., IEP development processes and goals). • Intervention components that required staff to spend time doing preparatory or administrative work (e.g., paperwork). • Technical complications related to the design and development of some technology tools (e.g., downtime while a technology tool was being updated and technology glitches).

Table B-1. Factors Found to Support or Hinder Implementation or Sustainment of Model Demonstration and/or Technology Implementation Projects (continued)

Factors related to:	Relationship of factors to ease or quality of implementation or sustainment
<p>Implementation strategies: activities grantees did to facilitate implementation and/or sustainment. For example:</p> <ul style="list-style-type: none"> • Site selection • Staffing strategies (e.g., whether grantees used staff at sites or hired their own staff to deliver intervention) • How PD was done • How coaching was done • How grantees helped build administrative support/capacity. 	<p>Supported implementation or sustainment</p> <p>Site selection</p> <ul style="list-style-type: none"> • “Piloting” interventions in one site the first year, holding back implementation in other sites until year 2 to benefit from year 1 experience. • Using schools that volunteered to participate, which increased the likelihood that teachers would advocate for the intervention in their schools. • Selecting sites with which grantees had previously worked, which made implementation easier in some cases (e.g., existing university-school partnerships). • Selecting sites that served a relatively large number of targeted participants (e.g., English learners, youth in the juvenile justice system) or had desired diversity. • Letting a district superintendent pick the schools perceived to have greatest need for the model. • Working with staff at a higher organizational level (e.g., state, district) to pick local sites that were perceived to be a good match for the project. • Conducting a readiness assessment before implementation, with key indicators being willingness, ability, and feasibility. • Involving leaders and practitioners in identifying common goals and prioritizing needs related to model implementation and developing an action plan. • Getting written affirmation of district support before reaching out to schools. <p>Preparation and obtaining buy-in</p> <ul style="list-style-type: none"> • Meeting with site leaders in advance of implementation. • Encouraging a collaborative strategy between grantee and site staff. • Meeting frequently, talking often to build confidence and trust. • Using staff “beliefs and needs” surveys, observations, record reviews, and other assessment procedures to determine site capacity for implementing the intervention. • Providing grant funds to support additional work and/or staff. • Sharing documented improvements in outcomes with site staff and stakeholders (e.g., parents, site leaders).

Table B-1. Factors Found to Support or Hinder Implementation or Sustainment of Model Demonstration and/or Technology Implementation Projects (continued)

Factors related to:	Relationship of factors to ease or quality of implementation or sustainment
Implementation strategies (continued)	<p>Supported implementation or sustainment (continued)</p> <p><i>Staffing strategy and supports</i></p> <ul style="list-style-type: none"> • Offering stipends or other incentives to participants or implementers. • Having regularly scheduled “check-ins” (online, by e-mail, or by phone) with intervention users. • Incorporating staff input in shaping the intervention. • Involving district personnel in support of school implementation. <p><i>Professional development, coaching, and other supports</i></p> <ul style="list-style-type: none"> • Having early one-on-one meetings with site implementers to introduce the intervention and answer individual questions and address concerns. • Providing intensive PD early on to give site staff in-depth exposure to the intervention and to emphasize its importance in improving child outcomes. • Providing training sessions with opportunities for reflection, practice, and collaborative learning. • Assessing staff’s baseline skills and knowledge to help shape professional development. • Employing continuous feedback mechanisms (e.g., weekly meetings, frequent brief surveys) throughout PD to modify training content and approach. Being responsive to participant feedback on PD and coaching strategies/content. • Tailoring PD to each site. • Providing coaching/job-embedded PD, differentiated for each teacher. • Thinking of sites as partners in defining issues and problems to address in PD.

Table B-1. Factors Found to Support or Hinder Implementation or Sustainment of Model Demonstration and/or Technology Implementation Projects (continued)

Factors related to:	Relationship of factors to ease or quality of implementation or sustainment
Implementation strategies (continued)	<p>Supported implementation or sustainment (continued) <i>Professional development and coaching (concluded)</i></p> <ul style="list-style-type: none"> • Using video examples that model implementation, checklists for the presence of desired practices, and group discussion. • Using “interactive journaling,”²³ which garnered feedback from implementers and let them communicate questions to grantee staff at any time. • Using cost-effective PD tools and approaches to ensure ongoing PD. • Volunteering grantee staff to substitute in classrooms for implementing teachers while they participated in PD. • Including training on measurement and data use. • Providing handouts, rubrics, and posters that supported intervention use. • Using professional learning communities to support learning to use the intervention. • PD emphasizing cultural and linguistic features in the teaching and learning environment to engage all teachers and students. <p><i>Developing administrative support</i></p> <ul style="list-style-type: none"> • Building school leadership capacity and teaming with implementing staff and leaders to support them. • Co-developing with site leaders “action plans” to articulate primary goals, tasks, and the roles of key personnel and to evaluate progress. • Aligning intervention protocols with data systems to provide ongoing formative feedback on implementation progress and outcomes. • Informing administrators of free resources to support their intervention and implementation. • Making frequent site visits to provide in-person support, supplemented with distance and online approaches. • Facilitating conversations by site personnel across agencies and systems. • Creating an advisory group with representatives of all organizations involved and stakeholder groups within them to discuss implementation issues and resolve them collaboratively.

²³ <https://www.pinterest.com/krystamphillips/interactive-journaling/>

Table B-1. Factors Found to Support or Hinder Implementation or Sustainment of Model Demonstration and/or Technology Implementation Projects (continued)

Factors related to:	Relationship of factors to ease or quality of implementation or sustainment
Implementation strategies (continued)	<p>Supported implementation or sustainment (concluded)</p> <p><i>Exit strategy</i></p> <ul style="list-style-type: none"> • Planning for sustainment from the start, shifting responsibility (e.g., for PD, leading data meetings) gradually to sites. • Providing leeway for adjusting the intervention to particular sites to increase the odds of sustainment. • Developing and leaving behind easy-to-use tools for staff use (e.g., measurement technologies, checklists, meeting protocols) to support sustainment. <p>Hindered implementation or sustainment</p> <ul style="list-style-type: none"> • Choosing sites that were relatively far from the grantee location, with no grantee staff living close by, which imposed travel demands and invited weather disruptions. • Virtual meetings, which were hampered by time zone differences across sites. • Interventions that required site personnel to change their perspectives and assumptions, not just learn new skills. • Using a “passive” approach to PD (i.e., being available to those actively seeking it), which limited use of PD and its benefits to implementation. • Discovering site personnel did not have the foundational skills/knowledge to implement the intervention, which required unanticipated increases in PD. • Time requirements for teachers and providers completing PD. • Choosing sites with a history of low parent engagement when parents are key to the intervention. • Working with early intervention providers who were contract staff and not paid to attend PD, participate in collaborative groups, etc. • Unanticipated expectations for training of grantee staff or of services to be provided clients that are imposed by partner organizations. • Site restrictions on data sharing.

Table B-1. Factors Found to Support or Hinder Implementation or Sustainment of Model Demonstration and/or Technology Implementation Projects (continued)

Factors related to:	Relationship of factors to ease or quality of implementation or sustainment
Implementation strategies (concluded)	Hindered implementation or sustainment (concluded) <ul style="list-style-type: none"> • Inadequate PD on using the technology tool. • Complexity of PD and overly high expectations for site staffs' learning. • Using personnel employed by the project (i.e., not the site), which impeded the ability of the sites to sustain the intervention. • MDPs buying materials and supplementing site staff salaries to support implementation, which challenged the site to sustain the model with its own funds.
Characteristics of the sites/destination organizations For example: <ul style="list-style-type: none"> • buy-in/commitment of leaders • ability of site to provide necessary resources • staff attitudes and beliefs about the intervention • staff skills/prior experience or training related to intervention • organizational climate (e.g., leadership, morale, quality of communications among site personnel) • Population served (e.g., high poverty, high % of English learners). 	Supported implementation or sustainment <ul style="list-style-type: none"> • Strong and clearly communicated buy-in from site leaders and practitioners. • Strong site leadership. • Intervention aligning well with local priorities and policies. • Intervention well matched to site culture. • Funding to support implementers' attendance at PD sessions. • Having prior experience with key intervention or implementation components. • Having resources needed for implementation and sustainment (e.g., site-based PD staff and coaches). • Schedules that enable common planning time for implementers. • Having implementers who are skilled in the fundamentals underlying the intervention, including creating an environment that is conducive to learning. • A stable, workable fiscal situation. • Existing organizations' willingness to support the project and endorse the intervention. • New leaders endorsing the project and intervention.

Table B-1. Factors Found to Support or Hinder Implementation or Sustainment of Model Demonstration and/or Technology Implementation Projects (continued)

Factors related to:	Relationship of factors to ease or quality of implementation or sustainment
Characteristics of the sites/ destination organizations (continued)	<p>Hindered implementation or sustainment</p> <p><i>Organizational factors</i></p> <ul style="list-style-type: none"> • Competing initiatives at state and local levels. • Poor interagency communication among agency partners or with grantee staff. • Conflicts in policies and procedures of collaborating agencies. • Lack of needed resources at the sites. • Philosophical differences between the site and the intervention. • Staff turnover and unfilled positions. • Limited Internet access and working technology. • Scheduling, logistical challenges. • Leaders misunderstanding or misrepresenting the support to be provided to implementers. • Large class sizes. • Lengthy IRB approval process. • Limits on access to IEPs and other documents to ascertain children's services and needs. • State billing practices that limit payment for participation in some intervention components. <p><i>Staff factors</i></p> <ul style="list-style-type: none"> • A lack of leadership in key positions. • Lack of commitment of site staff, negative attitudes toward intervention (e.g., because of demands on time, entrenched commitment to the present way of doing things, data collection requirements). • Competing demands on site personnel's time; overworked staff. • Poor staff familiarity with basic technologies, lack of foundational knowledge or skills. • Too few staff to adequately serve all those interested in the intervention.

Table B-1. Factors Found to Support or Hinder Implementation or Sustainment of Model Demonstration and/or Technology Implementation Projects (concluded)

Factors related to:	Relationship of factors to ease or quality of implementation or sustainment
Characteristics of the sites/ destination organizations (concluded)	Hindered implementation or sustainment (concluded) <i>Population served</i> <ul style="list-style-type: none"> • Students' limited technical literacy skills. • Small population of eligible children or youth at selected sites. • Serving children or families with multiple challenges.
External influences	Supported implementation or sustainment <ul style="list-style-type: none"> • Having access to outside resources (e.g., a state-level TA network). • District support and leadership for school-based interventions. • Alignment with national or state standards, priorities (e.g., CCSS). • Partnerships with external organizations. Hindered implementation or sustainment <ul style="list-style-type: none"> • State budget cuts impacting instruction and services available. • Policy changes that affected participation of staff or students or implementation of particular aspects of the intervention. • Having Part C (early intervention) and Part B (early childhood education) administered in separate agencies in some states, which makes providing the intervention to children traversing the system boundary difficult. • Needed services for children/youth/families unavailable in the community. • Delays in district approval for implementation and getting consent to participate. • Union restrictions on teachers' responsibilities and schedules. • Reimbursement policies of state early intervention systems that discourage or prevent interventionists from attending training or meetings.

Appendix C

Tools and Resources for Assessing Readiness to Advance to the Next Implementation Stage

Table C-1. Example Tools for Assessing Readiness to Advance to the Next Implementation Stage

Criteria to measure readiness to move from:	Example tool or resource
<i>Initiation to preparation stage</i>	
<p>Do site personnel exhibit:</p> <ul style="list-style-type: none"> ▪ Knowledge of the evidence supporting the effectiveness of the intervention? ▪ An understanding of how the intervention would fit with other initiatives and other priorities (e.g., local and state priorities)? ▪ An understanding of how infrastructure and organizational practices at all levels need to change? ▪ An understanding of the types of activities that might be required for all implementers? ▪ A strong commitment to investing the requisite time and resources to this vision and to the success of the initiative? 	<ul style="list-style-type: none"> ▪ The Hexagon Tool – A tool that allows developers to assess the appropriateness of an intervention by rating it in six categories: need, fit, resources, evidence, readiness, and capacity (Blase, Kiser, & Van Dyke, 2013) ▪ Site Assessment Worksheet (pp. 10-15) – A tool to assess sites' readiness for model demonstration implementation (Shaver, Wagner, & Lenz, 2011) ▪ Initiative Inventory – Inventory of past and current programs at the site, giving a clear picture of successful strategies, challenges, and existing mandates and resource commitments (State Implementation & Scaling-up of Evidence-based Practices Center [SISEP], 2015a) ▪ Worksheet: Strategic Analysis of the Implementation Drivers – A worksheet on which implementation teams identify activities associated with each implementation driver and who is accountable for each (SISEP, 2015b) ▪ Exploration Stage-Related Activities Checklist (p. 6) – A checklist to determine the level of implementation of activities in the exploration stage (e.g., “in place,” “initiated or partially in place,” “not yet initiated”) (Blase & Fixsen, 2013) ▪ Show Me Am I Ready Scale – A tool designed to help implementation sites determine their readiness for implementation across multiple domains, including buy-in from key stakeholders, availability of resources, and strength of leadership (Missouri Department of Health and Senior Services, n.d.) ▪ Stakeholder Analysis– A tool implementers use to identify, prioritize, and understand all stakeholders affected by an intervention (MindTools, 2015a) ▪ School Climate Survey – A tool that measures staff members' perceptions about administrative support, student behavior, and availability of resources at their school (Perkins, 2006)
<i>Preparation to initial implementation stage</i>	
<p>Are the following in place:</p> <ul style="list-style-type: none"> ▪ A clear understanding of the intervention components? 	<ul style="list-style-type: none"> ▪ Usage Rating Profile Intervention (URP-I) – A self-report that measures implementers' understanding and acceptance of and attitude toward the feasibility of an intervention (Chafouleas, Briesch, & Riley-Tillman, 2009) ▪ Protocol for Determining the Language of Collaboration – An example tool that assesses the extent of shared understanding of key language among all RtI implementers (Ehren, Laster, & Watts-Taffe, 2009)

Table C-1. Example Tools for Assessing Readiness to Advance to the Next Implementation Stage (continued)

Criteria to measure readiness to move from:	Example tool or resource
<i>Preparation to initial implementation stage (concluded)</i>	
<p>Are the following in place:</p> <ul style="list-style-type: none"> ▪ Trained implementers who exhibit the needed knowledge, skills, and confidence to begin implementation? ▪ Staffing and plans for ongoing professional development and coaching? ▪ Resources, leadership, and administrative supports required for implementation? ▪ Procedures for performance assessment and recognition of implementing staff? ▪ Data collection and analysis procedures to track fidelity and social validity of the new practices? ▪ Mechanisms for responding to implementation challenges and making adjustments? 	<ul style="list-style-type: none"> ▪ Practice Profile – A profile in which developers identify guiding principles, critical components, and associated activities of an intervention to determine the necessary knowledge, skills, and abilities of implementers as well as ways to measure success (SISEP, 2014) ▪ Implementation Team Checklist – A checklist used to monitor the development and use of intervention and implementation components by the implementation team (SISEP, 2013b) ▪ Implementation Feasibility & Acceptability Scale – To be administered after professional development seminars, this tool measures implementers’ satisfaction with the training and attitude toward feasibility of the intervention (Lyon, n.d.) ▪ Knowledge Exchange Outcomes Tool (pp. 69-73) – A self-report that measures implementers’ understanding of the requirements and effects of an intervention as well as their willingness to adopt and disseminate. This tool can be administered at various time throughout the implementation process (Skinner, 2007) ▪ Installation Stage-Related Activities Checklist (p. 7) – A checklist to determine the level of implementation of activities in the installation stage (e.g. “in place,” “initiated or partially in place,” “not yet initiated”) (Blase & Fixsen, 2013) ▪ Innovation Configuration Map – A tool used to define and measure the ideal outcomes of an intervention program (Richardson, 2004) ▪ Sample Performance Assessment Checklist and Social Validity tool (pp. 124-125) – Sample tools that measure student performance and teacher acceptance of a newly implemented math assessment (Connell, 2005) ▪ Stages of Concern Questionnaire – A questionnaire given to teachers to determine their areas of concern about an intervention at various times during the implementation process (George, Hall, Stiegelbauer, & Abdullah, 2006) ▪ Acceptability of Intervention Pre & Post Test (pp. 86-88) – A sample questionnaire that measures teachers’ acceptability of a behavior intervention before and after implementation (Henninger, 2010) ▪ Root Cause Analysis– A tool used to solve problems that occur during implementation. Steps of the analysis include defining the problem, collecting data, identifying possible causes, and recommending solutions (MindTools, 2015b) ▪ Plan-Do-Check-Act (PDCA) Tool – A tool used to identify the most effective solutions for problems that occur during implementation (University of Washington, 2015a) ▪ The 5 Why’s – A tool used to help implementers and developers identify the root cause of a problem quickly (University of Washington, 2015b)

Table C-1. Example Tools for Assessing Readiness to Advance to the Next Implementation Stage (continued)

Criteria to measure readiness to move from:	Example tool or resource
<i>Initial implementation to full implementation stage</i>	
<p>Are the following in place:</p> <ul style="list-style-type: none"> ▪ Qualified, trained staff for all implementation roles? ▪ Professional development and coaching plans, schedules, and accountability procedures? ▪ Procedures for performance assessment and recognition of implementing staff? ▪ Data collection, analysis, and reporting procedures to track fidelity, social validity, and outcomes? ▪ Policies and procedures to support the new way of work? ▪ Communication mechanisms that use evaluation information and transmit this information to funders and other stakeholders for decisionmaking? 	<ul style="list-style-type: none"> ▪ Checklist for Implementation Driver Best Practices – An assessment tool in which implementers rate the extent to which best practices are in place for each implementation driver, including recruitment and selection of staff, training, coaching, and decision support data systems (Fixsen, Blase, Naoom, & Duda, 2015) ▪ Initial Implementation Stage-Related Activities Checklist (p. 8) – A checklist to determine the level of implementation of activities in the initial implementation stage (“in place,” “initiated or partially in place,” “not yet initiated”) (Blase & Fixsen, 2013) ▪ Professional Development Exit Questionnaire – A tool to assess the perceived value of professional development according to participants (SERVE Center, n.d.) ▪ Training Plan Template – A tool used to define the intervention components that need to be taught as well as methods of teaching and assessment (SISEP, 2013c) ▪ Coaching Service Delivery Plan – A tool that enables implementers to define the concepts being coached, the frequency of the sessions, and the expectations for all participants (SISEP, 2015c) ▪ The IRIS Center Sample Social Validity Measure – A questionnaire that uses a 5-point scale to measure implementers’ attitude toward the importance, effectiveness, and feasibility of the intervention (The IRIS Center, 2015) ▪ Checklist of Observable Procedures During Rtl Full Implementation Stage – An example tool that assesses implementation of a range of Rtl procedures, including data analysis, assessment, and problem solving (Hall, 2008) ▪ Mapping Feedback and Feedforward Pathways – A tool to measure communication pathways among implementation drivers and identify next steps in improving communication (SISEP, 2013a) ▪ Communication Plan – A tool that assists implementers and developers in identifying necessary steps for implementation communication, selecting parties responsible, and setting deadlines (University of Washington, 2015c)
<i>Full implementation to sustainment stage</i>	
<p>Have the following been achieved:</p> <ul style="list-style-type: none"> ▪ High fidelity levels among implementers? ▪ Improved/improving outcomes (e.g., higher test scores, fewer discipline referrals, improved language acquisition)? 	<ul style="list-style-type: none"> ▪ California Healthy Kids Fidelity Guidelines and Checklists – A link to research-validated sample fidelity checklists used by education programs (California Healthy Kids Resource Center, n.d.) ▪ Treatment Integrity Protocols – This link provides access to a variety of protocols and checklists that have been used to measure implementation fidelity for a range of programs (Kovaleski, n.d.) ▪ Levels of Use Interview Protocol – A component of the Concerns-Based Adoption Model, this protocol enables implementation leaders to measure the extent to which staff are

	using a program with fidelity (SEDL, n.d.)
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Table C-1. Example Tools for Assessing Readiness to Advance to the Next Implementation Stage (continued)

Criteria to measure readiness to move from:	Example tool or resource
<i>Full implementation to sustainment stage (concluded)</i>	
<p>When the supports and resources of the grant are withdrawn, will the implementing organization have the capacity to</p> <ul style="list-style-type: none"> Continue delivering the intervention to the targeted population? Provide the infrastructure and supports necessary, including PD? Incorporate intervention practices and procedures into business as usual, including assessing fidelity? 	<ul style="list-style-type: none"> Level of Institutionalization (LOIN) Scales for Health Promotion Programs – A tool for healthcare and social programs that assesses the extent of program integration into organizations (Goodman, McLeroy, Steckler, & Hoyle, 1993) SUBSIST PBS Sustainability Checklist – A self-assessment that measures schools' capacity to sustain Positive Behavior Supports (PBS) across multiple dimensions including leadership support and perceived priority and effectiveness (McIntosh, 2010) Program Sustainability Assessment Tool – A tool used to assess an organization's capacity to sustain an intervention across a range of organizational factors (Washington University, 2013) Evidence-Based Practice (EBP) Sustaining Telephone Survey – A telephone survey that assesses the extent of continued implementation of an intervention after program developers have withdrawn support (Aarons, 2007) Sustainability Planning Worksheet – A tool to support implementers in determining long-term costs and benefits of a particular intervention program (EPIS Center, n.d.) Sustainability Model and Guide – A health service sustainability model designed to predict levels of sustainability across three domains of an organization: process, infrastructure, and staff. It can be used throughout multiple stages of implementation (Maher, Gustafson, & Evans, 2008) Fidelity Assessment Common Ingredients Tool (FACIT) Protocol and Scoresheet (pp.35-68) – Sample interview questions for supervisory and nonsupervisory staff to measure fidelity and social validity of consumer-operated services (Substance Abuse and Mental Health Services Administration [SAMSA], 2011)
<i>Sustainment to dissemination stage</i>	
<p>Are the following in place to support replication and dissemination and reception:</p> <ul style="list-style-type: none"> Program information about the intervention, how it works (e.g., the need it addresses, the theory and evidence behind it), and resources and supports necessary for implementation? Clear documentation of the features of the intervention, including the core intervention components? 	<ul style="list-style-type: none"> Illustrative Replication Manual Table of Contents – A sample table of contents for a model replication manual (Shaver, Lenz, Wagner, & Greene, 2015). Template for Strategic Communications Plan – A template that supports program developers in developing a plan for communicating program information and outcomes to a range of key audiences (W.K. Kellogg Foundation, 2006) Report on Fidelity and Adaptations – A fidelity assessment to measure program implementation and track adaptations made to the program overtime (Cummins & Goddard, 2003) SW-PBS: Implementers' Blueprint and Self-Assessment (pp. 44-61) – A guide for sustaining or replicating SW-PBS that includes a self-assessment checklist, action planning template for start-up activities, and a school-team implementation checklist (Algozzine et al., 2004)

Table C-1. Example Tools for Assessing Readiness to Advance to the Next Implementation Stage (concluded)

Criteria to measure readiness to move from:	Example tool or resource
<i>Sustainment to dissemination stage (concluded)</i>	
<ul style="list-style-type: none"> • Identification of the professional development, resources, infrastructure, and other supports necessary for implementation? • Training resources (e.g., manuals, videos, checklists)? • Tools for assessing progress (e.g., measures of fidelity, social acceptance, and outcomes)? • A dissemination plan (e.g., intended audience, vehicles, and timing)? 	<ul style="list-style-type: none"> ▪ Dissemination Self-Inventory – A sample tool to measure the effectiveness of dissemination plans across four domains of dissemination (National Center for the Dissemination of Disability Research, 2015) ▪ Developing a Dissemination Plan – A short guide to support program developers in considering all components of a dissemination plan (Canadian Health Services Research Foundation, n.d.) ▪ Build Your Dissemination Plan: A Workbook – A step-by-step guide to support program developers in building their dissemination plan (National Dissemination Center for Children with Disabilities, 2013)

Table C-1 References

- Aarons, G. (2007). *EBP sustaining telephone survey*. Retrieved from http://www.seattleimplementation.org/wp-content/uploads/2013/03/M_EBPSustainingTelephoneSurvey_2007.pdf
- Algozinne, R., Barrett, S., Dunlap, G., Eber, L., Horner, R., Kincaid, D., ... Sugai, G. (2004). *School-wide positive behavior support: Implementers' blueprint and self-assessment* [Word Document]. Retrieved from <https://www.pbis.org/resource/713/school-wide-positive-behavior-support-implementers%E2%80%99-blueprint-and-self-assessment>
- Blase, K., & Fixsen, D. (2013). *Stages of implementation analysis: Where are we?* Chapel Hill: National Implementation Research Network. FPG Child Development Institute, University of North Carolina at Chapel Hill.
- Blase, K., Kiser, L., & Van Dyke, M. (2013). *The hexagon tool: Exploring context*. Chapel Hill, NC: National Implementation Research Network, FPG Child Development Institute, University of North Carolina at Chapel Hill.
- California Healthy Kids Resource Center (n.d.). *Fidelity guidelines and checklists* [web page]. Sacramento, CA: California Department of Education and California Department of Public Health. Retrieved from www.californiahealthykids.org/fidelity
- Canadian Health Services Research Foundation (n.d.). *Developing a dissemination plan*. Retrieved from http://www.cfhi-fcass.ca/Migrated/PDF/CommunicationNotes/dissemination_plan_e.pdf
- Chafouleas, S., Briesch, A., & Riley-Tillman, C. (2009). *Usage rating profile-intervention (URP-I)*. Storrs: University of Connecticut. Retrieved from www.seattleimplementation.org/wp-content/uploads/2012/10/M_S_Chaufouleasetal_URP-I_2007.pdf
- Connell, Jr., J. E. (2005). *Constructing a math application, curriculum-based assessment: An analysis of the relationship between applications problems, computation problems and criterion-referenced assessments* (Unpublished doctoral dissertation). Louisiana State University, Baton Rouge, LA.
- Cummins, M., & Goddard, C. (2003). *Assessing program fidelity and adaptations*. Washington, DC: Education Development Center.

- Ehren, B., Laster, B., & Watts-Taffe, S. (2009). *Creating shared language for collaboration in RTI*. New York, NY: RTI Action Network, National Center for Learning Disabilities.
- EPIS Center. (n.d.). *Sustainability planning worksheet*. State College: Pennsylvania State University. Retrieved from <http://www.episcenter.psu.edu/sites/default/files/Sustainability%20Planning%20Worksheet%20-%20Identifying%20Funders.pdf>
- Fixsen, D., Blasé, K., Naoom, S., & Duda, M. (2015). *Implementation drivers: Assessing best practices*. Chapel Hill, NC: National Implementation Research Network (NIRN), FPG Child Development Institute, University of North Carolina at Chapel Hill.
- George, A., Hall, G., Stiegelbauer, S., & Abdullah, S. (2006). *Measuring implementation in schools: The stages of concern questionnaire*. Austin, TX: SEDL.
- Goodman, R., McLeroy, K., Steckler, A., & Hoyle, R. (1993). Development of level of institutionalization (LoIn) scales for health promotion programs. *Healthy Education Quarterly*, 20(2), 161-178.
- Hall, S. L. (2008). *Checklist of observable processes during RTI full implementation stage*. New York, NY: RTI Action Network, National Center for Learning Disabilities. Retrieved from: http://rtinetwork.org/images/content/downloads/get%20started/hall_checklist.pdf
- Henninger, K. (2010). *Exploring the relationship between factors of implementation, treatment integrity and reading fluency* (Doctoral dissertation). *Dissertations*, Paper 237. Amherst, Massachusetts: University of Massachusetts-Amherst.
- Kovaleski, J. (n.d.). *Treatment integrity protocols* [web page]. New York, NY: RTI Action Network, National Center for Learning Disabilities. Retrieved from <http://rtinetwork.org/getstarted/evaluate/treatment-integrity-protocols>
- Lyon, A. (n.d.) *Training/practice acceptability*. Seattle: University of Washington.
- Maher, L., Gustafson, D., & Evans, A. (2008). *Sustainability model and guide*. Coventry, England: NHS Institute for Innovation and Improvement.
- McIntosh, K. (2010). *SUBSIST PBS sustainability checklist: Self-assessment and action planning tool for school teams*. Seattle, WA: Northwest PBIS Network.
- MindTools (2015a). *Stakeholder analysis*. Retrieved from https://www.mindtools.com/pages/article/newPPM_07.htm
- MindTools (2015b). *Root cause analysis*. Retrieved from https://www.mindtools.com/pages/article/newTMC_80.htm
- Missouri Department of Health and Senior Services. (n.d.). *Assessing your readiness worksheet: Show Me I Am Ready scale*. Retrieved from <http://health.mo.gov/data/InterventionMICA/AssessingYourReadinessWorksheet.pdf>
- National Center for the Dissemination of Disability Research. (2015). *NCDDR's dissemination self-inventory* [web page]. Retrieved from http://www.ncddr.org/cgi-bin/selfinventory.cgi?location=how_can_it_help_me
- National Dissemination Center for Children with Disabilities. (2013). *Build your dissemination plan: A workbook*. Washington, DC: Author.
- Perkins, B. K. (2006). *American school climate survey teacher version-2006*. New Haven, CT: Author. Retrieved from http://www.schoolclimatesurvey.com/files/Teacher_ASC_Survey_2006_Verson_2.1.5.1.pdf
- Richardson, J. (2004). Taking measure: Innovation Configurations gauge the progress of a new initiative. *Tools for Schools*, 1-7.
- SEDL. (n.d.). *Concerns-based adoption model: Levels of use*. Austin, TX: Author.

- SERVE Center. (n.d.). *Professional development exit questionnaire*. Greensboro: University of North Carolina at Greensboro. Retrieved from www.serve.org/uploads/docs/PDQ.pdf
- Shaver, D., Lenz, K., Wagner, M., & Greene (2015). *Planning for replication and dissemination from the start: Guidelines for model demonstration projects*. Menlo Park, CA: SRI International.
- Shaver, D., Wagner, M., & Lenz, K. (2011). *Assessing sites for model demonstration: Lessons learned from OSEP grantees*. Menlo Park, CA: SRI International.
- Skinner, K. (2007). Developing a tool to measure knowledge exchange outcomes. *The Canadian Journal of Program Evaluation*, 22(1), 49-73.
- State Implementation and Scaling-up of Evidence Based Practices Center. (2013a). *Mapping feedback and feedforward pathways*. Chapel Hill: National Implementation Research Network, FPG Child Development Institute, University of North Carolina at Chapel Hill.
- State Implementation and Scaling-up of Evidence Based Practices Center. (2013b). *Implementation team checklist*. Chapel Hill: National Implementation Research Network, FPG Child Development Institute, University of North Carolina at Chapel Hill.
- State Implementation and Scaling-up of Evidence Based Practices Center. (2013c). *Training plan template*. Chapel Hill: National Implementation Research Network, FPG Child Development Institute, University of North Carolina at Chapel Hill.
- State Implementation and Scaling-up of Evidence Based Practices Center. (2014). *Practice profile planning tool*. Chapel Hill: National Implementation Research Network, FPG Child Development Institute, University of North Carolina at Chapel Hill.
- State Implementation and Scaling-up of Evidence Based Practices Center. (2015a). *Initiative inventory*. Chapel Hill: National Implementation Research Network, FPG Child Development Institute, University of North Carolina at Chapel Hill.
- State Implementation and Scaling-up of Evidence Based Practices Center. (2015b). *Worksheet: Strategic analysis of the implementation drivers*. Chapel Hill: National Implementation Research Network, FPG Child Development Institute, University of North Carolina at Chapel Hill.
- State Implementation and Scaling-up of Evidence Based Practices Center. (2015c). *Coaching service delivery plan template*. Chapel Hill: National Implementation Research Network, FPG Child Development Institute, University of North Carolina at Chapel Hill.
- Substance Abuse and Mental Health Services Administration. (2011). *Consumer-operated services: Evaluating your program*. HHS Pub. No. SMA-11-4633, Rockville, MD: Center for Mental Health Services, Substance Abuse and Mental Health Services Administration, U.S. Department of Health and Human Services.
- The IRIS Center. (2015). *Functional behavior assessment: Identifying the reasons for problem behavior and developing a behavior plan*. Nashville, TN: Peabody College, Vanderbilt University. Retrieved from http://iris.peabody.vanderbilt.edu/module/fba/cresource/q3/p10/fba_10_link_questionnaire/
- University of Washington (2015a). *Plan-Do-Check-Act (PDCA)*. Retrieved from http://www.washington.edu/research/rapid/resources/toolsTemplates/plan_do_check_act.pdf
- University of Washington (2015b). *The 5 Whys*. Retrieved from http://www.washington.edu/research/rapid/resources/toolsTemplates/five_whys.pdf
- University of Washington (2015c). *Communication plan*. Retrieved from http://www.washington.edu/research/rapid/resources/toolsTemplates/cmu_plan_form.pdf
- Washington University. (2013). *The program sustainability tool v2*. Seattle, WA: Author.
- W.K.Kellogg Foundation. (2006). *Template for strategic communications plan*. East Battle Creek, MI: Author. Retrieved from <http://www.wkkgf.org/resource-directory/resource/2006/02/wk-kellogg-foundation-logic-model-development-guide>

Appendix D

MDCC Template Examples

MDCC Project Template

Records the story of the intervention development and implementation process

Section I. Exploration and Preparation	
Selecting the sites	
1. Describe how you selected the sites.	
a. How did you select and invite sites? What were your selection criteria?	
b. How did you obtain commitment from the sites to implement the model or technology tool? How collaborative was the process?	
c. What did you learn from the site selection process? Would you do anything differently next time?	
Preparing the sites	
2. Describe preparatory activities with sites and how they went.	
a. What activities were conducted to prepare for installation of the model or technology tool at the sites (e.g., meetings and information gathering)?	
b. How did you try to promote buy-in among the various stakeholders at the sites?	
c. How did your preparatory activities go at the sites? What if anything, surprised you during your initial contacts and activities with the sites?	
Preparing the MDP or technology implementation project team for supporting the sites	
3. Describe how your project selected and prepared staff to support implementation.	
a. Describe your staffing strategy for the project (e.g., to what extent did you use your own organization's staff vs. staff at the sites to support or deliver the intervention)?	
b. How did you prepare project staff members for their work with the sites?	
Identifying resources needed to implement the model or technology tool in the sites	
4. Describe how you identified resources needed to implement the model or technology tool.	
a. Describe your approach to identifying the resources, materials, and supports needed.	
b. What resources, materials and supports did you identify as necessary to implement the model or technology tool?	

Section II. Implementation	
Support provided	
5. Describe professional development activities provided to users and how they went.	
a. What formal professional development was given to model or technology tool implementers (i.e., those delivering the practices and tools to the target population)? For example, to whom, what content, intensity/duration)? How was it delivered (e.g., face to face, virtually) and how did it go?	
b. What ongoing support to implementers, such as coaching or job-embedded support, was provided and how did it go?	
c. What other supports were provided to implementers?	
6. Describe support provided to site administrators and stakeholders.	
a. How did you involve site administrators and stakeholders in the project?	
b. What training and support did you provide them?	
c. How did providing support to administrators and stakeholders go?	
Using the model or technology tool	
7. Describe how implementation went this year, noting variations by site. Describe how each intervention component when this year.	
a. In what ways were site staff members successful in using practices related to core intervention components ? With which components were they the most successful? What explains differences in the degree to which site staff were able to implement various intervention components?	
b. What were the challenges site staff had in learning or using the core intervention components? (Include change over time, variations across types of staff.)	
c. In what ways were administrators and stakeholders successful in supporting implementation? What challenges did they experience in supporting implementation?	
d. What other successes or challenges did your project experience this year in the sites?	
Factors influencing implementation	
8. Describe the factors that have influenced implementation.	
a. What was the commitment level of	

the sites? How did you address lack of buy-in? What might you have done differently? What challenges remain?	
b. What site-level factors facilitated implementation? How did you take advantage of these factors?	
c. What site-level factors hindered implementation? How did you address challenges? What might you have done differently? What challenges remain?	
d. What external factors facilitated or hindered implementation of the model or technology tool?	
Section III: Sustaining and Disseminating the Model or Technology Tool	
Sustainment and Dissemination	
9. Describe efforts to develop conditions for sustainment of the model or technology tool.	
a. What activities/strategies did you establish at sites to sustain the model or technology tool?	
b. What resources exist to provide continued support at sites after completion of the MDP or technology implementation project?	
c. What site or broader issues/realities do you think will promote sustained implementation of the model or technology tool at the sites?	
d. What site or broader issues/realities do you think will hinder sustained implementation of the model or technology tool at the sites?	
10. Describe efforts to develop conditions for model or technology tool replication.	
a. What is your plan for replication and dissemination (e.g., dissemination vehicles, timeline, support to be provided)?	
b. What products, resources, and tools have been developed to support replication and dissemination?	
c. Describe any successes or challenges related to model or technology tool replication and dissemination.	
Section IV: Lessons Learned	
11. Consider the following questions.	
a. What are the important take-aways and key learnings from your	

experience about implementation and potential sustainment of the model or technology tool?	
b. Given what you learned from your experience, what would you do differently in the future to support implementation and sustainment of the model or technology tool at the site, program, or district levels?	
c. What advice would you give to OSEP or future grantees about implementation and sustainment?	

Interventions Specifications Template

Documents the specific features and design elements of the model/technology implementation project

I. Core Intervention Components	
1. Describe the population that is the target of the intervention (e.g., age, disability category, education or service delivery setting)	
2. Describe the core intervention components of the MDP or technology implementation project, including: <ul style="list-style-type: none"> • Key features • How intervention components will be delivered to target population (e.g., type of staff) • Setting (e.g., general education classroom) • Intensity/frequency of delivery (e.g., number of times per week) 	
II. Core Implementation Components	
3. Describe the formal training activities and materials specified to prepare the individuals listed below to fulfill their roles and responsibilities in implementing or supporting the model or technology tool including: <ul style="list-style-type: none"> • Length of training • Content • Format (e.g., face to face, live webinars, recorded webinars) • Frequency (once a month, ongoing) • Who provides the training activity 	
a. MDP or technology implementation project staff	
b. Practitioners responsible for delivering the intervention	
c. Administrators/support staff	
4. Describe the ongoing support (e.g., coaching, mentoring, supervision) provided to the individuals listed below as part of implementation. Include the amount, frequency, format, content, purpose, and trainers.	
a. MDP or technology implementation project staff	
b. Practitioners responsible for delivering the intervention	
c. Administrators/support staff	
5. Describe any other core implementation components (i.e., activities designed to help sites develop capacity to implement the model or technology tool)	
III. Other Specifications	
6. Describe anything else that is important to know about the specifications of the MDP or technology	

implementation project.	
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