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Resource Leveraging to Achieve Large-Scale Implementation of Effective Educational Practices

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Abstract

We propose in this article that a central element in the large-scale implementation of evidence-based practices is the process by which initial investment in local demonstrations is leveraged into larger implementation efforts. We offer a definition of this "resource leveraging" and propose a process for both measuring and reporting the effects of leveraging. We suggest that resource leveraging become a valid focus of future research and that the intentional measurement, planning, and management of resource leveraging be used to improve the scaling-up of effective practices.

Keywords

resource leveraging, implementation, scaling, PBIS

Resource leveraging is the process by which the outcomes from initial investment in personnel, materials, and events to achieve a targeted goal result in additional investment toward that goal. The assumption governing this concept is that without an initial, small investment, larger future investments are less likely (Rogers, 2003). Our thesis is that large-scale implementation of evidence-based educational practices often requires that initial implementation investments be used to leverage the size, scope, and sustained investment needed for scaling to occur. The purposes of this article are to offer a more operational definition of "resource leveraging," encourage the measurement of leveraging, and propose that leveraging be considered not just a topic of conceptual interest, but a formal tactic for any long-range implementation plan. We believe that the intentional measurement, planning, and management of resource leveraging will improve our ability to scale up effective practices.

It is appropriate to consider the role that resource leveraging plays in education given the current emphasis on adopting evidence-based practices (Cook & Odom, 2013; Flay et al., 2005; Horner, Sugai, & Anderson, 2010) and the articulation of implementation science (Fixsen et al., 2010; Fixsen, Naoom, Blase, Friedman, & Wallace, 2005; Horner, Sugai, & Fixsen, 2017). Interest in improving educational and community services has drawn from the growing movement in medicine to define and promote the use of practices that are evidence-based (Kellam & Langevin, 2003). The essential logic is that, as a society, resources are wasted when we invest in practices that are ineffective,

minimally effective, or less effective than available alternatives. Instead, we should use rigorous science to develop practices that are efficient and effective and use implementation strategies to make these practices available, sustainable, and scalable.

Evidence-Based Practice

The arguments in favor of promoting evidence-based practices are compelling but become more elusive when considered in detail. Medicine, psychology, and education are each engaged in debates about what constitutes evidence-based (Gersten et al., 2005; Kratochwill et al., 2010; Shavelson & Towne, 2002). Slocum et al. (2014) defined evidence-based practices broadly as any decision-making process that combines "(a) the best available evidence with (b) clinical expertise and (c) client values and context" (p. 44). For Slocum et al., it is the use of data by clinicians to

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achieve socially valued outcomes that make a practice evidence-based. Flay et al. (2005) focused more narrowly on specific treatments or procedures and offer useful guidance in their recommendation that an evidence-based practice is defined when (a) the observable components or procedures of a practice are defined with operational precision, (b) the valued outcome(s) of the practice is formally articulated, (c) the requirements of the implementer(s) (e.g., physician, school psychologist) are specified, and (d) the targeted population(s) and settings are clear. In essence, Flay et al. argued that an evidence-based practice cannot be defined without context. We need to know what the practice is, for whom it is intended, what it will accomplish, and the qualifications of those who use it. Describing a practice or program as evidence-based without stipulating the context is not helpful and leads to poor implementation planning.

Implementation Science

The self-discipline that Flay et al. (2005) encourage for defining evidence-based practices is well matched with the companion emergence of implementation science (Damschroder et al., 2009; Fixsen et al., 2005). Implementation science is defined in the health arena as " . . . the study of methods to promote the integration of research findings and evidence into health care policy and practice" (Fogarty International Center, 2016), and in education as "the study of factors that influence the full and effective use of innovations in practice" (National Implementation Research Network, 2015). A central tenet of implementation science is a series of stages that guide adoption and use of new practices (Fixsen et al., 2010). Within education, the unit of analysis for these stages typically is the school, where a team is expected (a) to *explore* the need and fit of a new practice, (b) then *install* the necessary structures (e.g., data collection, team operations, policies) needed for effective implementation, (c) then complete *initial implementation* of the practice, and finally (d) to reach *full implementation* of practices and systems needed for sustainability and scaling of the practice. A team may be in more than one stage at a time. For example, a school leadership team may be exploring new approaches to math instruction while educators are already engaged in initial implementation of an effective literacy innovation. Fixsen et al. (2010) pointed out that the stages of implementation are iterative in the sense that as new teams within a system encounter the new practice (e.g., additional schools or district), they require time to revisit the exploration stage and progress through the full implementation process.

The value of a stage-based vision of implementation is especially helpful in a complex system such as education, where schools are operated within districts, and districts are operated within both regions and states. The initial adoption of a practice at a school (or small cluster of schools) may be the decision of teams at the school(s) (and possibly the

district). As such, the processes of exploration, installation, and initial implementation may be local and require modest investment. The process of scaled implementation across a larger district, region, or state, however, is likely to require not only school-level team processing but also consideration by multiple teams at the district (and/or region/state). Our experience is that more substantial investment by teams at the district, region, and/or state is more likely if there is evidence that initial, smaller investment has been successful. This smaller investment (and the resulting outcomes) is then used to leverage access to the resources needed for large-scale implementation. A better understanding of when, where, and how leveraging occurs within the iterative stages of implementation may be helpful for improved efficiency and effectiveness of scaling efforts within education and across an array of disciplines.

Positive Behavioral Interventions and Support (PBIS) as an Example of an Evidence-Based Practice Brought to Scale

Our collective experience with large-scale implementation is informed primarily by work focused on PBIS. PBIS is a multitiered framework for establishing the school-wide social culture as well as the individualized behavior supports needed for schools to be effective learning environments (Horner et al., 2010; Lewis & Sugai, 1999; Simonsen, Sugai, & Negron, 2008; Sugai & Horner, 2009). PBIS integrates effective practices, functional systems, and data-based decision making. The broader framework of PBIS meets the criteria proposed by Slocum et al. (2014), and the specific procedures of Tier I, Tier II, and Tier III PBIS fit the more narrow criteria proposed by Flay et al. (2005). PBIS currently is being implemented in more than 25,000 schools in the United States (Sugai, 2017). Effective implementation of school-wide PBIS has been linked with significant reductions in disruptive behaviors and improved social skill knowledge (Barrett, Bradshaw, & Lewis-Palmer, 2008; Horner et al., 2009; Metzler, Biglan, Rusby, & Sprague, 2001; Sprague et al., 2001). Specifically, several studies, including two randomized controlled studies of school-wide PBIS in elementary schools, have shown that high-quality implementation of the model is associated with significant reductions in office discipline referrals and suspensions (Bradshaw, Mitchell, & Leaf, 2010; Horner et al., 2009) and other problem behavior (McIntosh, Bennett, & Price, 2011), such as teacher ratings of classroom behavior problems, concentration problems, emotion regulation problems, and bullying (Bradshaw, Waasdorp, & Leaf, 2015; Waasdorp, Bradshaw, & Leaf, 2012). Significant improvements also have been observed in student reports

of school climate (Horner et al., 2009; McIntosh et al., 2011), staff reports of the school's organizational health (e.g., principal leadership, teacher affiliation, and academic emphasis; Bradshaw, Koth, Thornton, & Leaf, 2009; Bradshaw, Reinke, Grown, Bevans, & Leaf, 2008; McIntosh et al., 2011), teacher self-efficacy (Kelm & McIntosh, 2012; Ross & Horner, 2007), and academic achievement (Bradshaw et al., 2010; Horner et al., 2009; McIntosh et al., 2011).

Twenty-one states each have over 500 schools currently engaged in implementing PBIS, and California alone reports over 2,400 schools using PBIS. Horner et al. (2014) recently reviewed the history of seven states that successfully implemented PBIS with at least 500 schools and found through formal interviews that a key step in the implementation process was the development of an initial demonstration of effect, and use of outcomes from this demonstration to recruit resources for scaling. The question of relevance for this article is, "What lessons have been learned regarding the role that resource leveraging has played in states where PBIS implementation has been more dramatic and sustained?" To address this question, we propose to explore with more precision a definition of resource leveraging and examine both the measurement of resource leveraging, and the procedures for effective leveraging within implementation.

Resource Leveraging Defined

The current definition of resource leveraging put forth above—a process by which the outcomes from the initial investment in personnel, materials, and events to achieve a targeted goal result in additional investment being allocated toward that goal—is helpful from a conceptual perspective but requires unpacking to be operationalized. Specifically, functional definitions are needed for the following elements:

Organizational Unit

The organizational unit must be defined to assess leveraging. The organizational unit should have a clearly defined organizational chart that identifies personnel roles and a budget that includes the costs associated with variables such as allocation of personnel, materials, and space. For example, is the unit of analysis a school, district, state, or some other defined organization?

Outcome/Initiative

Implementation efforts typically focus on the use of practices (e.g., Early Reading Intervention: Carnine, 1997, First Step to Success: Walker et al., 1998, PBIS: Sugai & Horner, 2014) that are associated with valued outcomes (e.g., improved literacy, improved school-wide social culture, or improved classroom behavior). Effective resource leveraging requires precise designation of the practice or practices being considered. The value of also defining the outcome expected from a practice or initiative is that multiple practices/initiatives that have the same outcome(s) may be considered in concert.

Analysis Time frame

Assessing the impact of leveraging requires identifying at least two points in time (and often more) and comparing the resources allocated to an initiative at each point in time. As such, specifying the time frame for a leveraging analysis is essential. The selection of points in time (e.g., Time 1 and Time 2) in a leveraging analysis will often be determined more by evaluation and political considerations than is traditional in formal research studies. Nearly all elementary schools, for example, have some ongoing level of investment in early literacy and school-wide social culture. The definition of Time 1 may be during an initial baseline level of investment within a district, and Time 2 may be the point when additional investment is made to launch a pilot or demonstration effort with a small cohort of schools. Time 3 may be the point when the pilot results are used as the initial proof of concept to scale the initiative to all elementary schools in the district, region, or state. Points in time will be determined differently depending on the evaluation question and set of initiatives under analysis. Our message is that there is not one correct time frame; instead, all leveraging assessments require operational documentation of the points in time that are being compared, as well as the rationale for selecting those points in time.

Resource Allocation

The key to any assessment of leveraging is the ability to define and monetize the resources (e.g., personnel, events, and materials) allocated to achieve an outcome or implement an initiative. Resources allocated at Time 1 are compared with the resources allocated at Time 2, Time 3, and so on.

Example

An operational definition of leveraging is framed for a specified organizational unit and a targeted outcome or initiative. The metric for leveraging is the change in resources allocated to achieve the outcome (new resources added or existing resources repurposed) from one time to another. In this example, consider a Midwestern state that received a federal grant for US$1.3 million per year, for each of 5 years to improve the social culture and reduce the rate of problem behavior in schools throughout the state. The state department of education selected PBIS as their approach to

achieve this outcome and set up a state-wide technical assistance unit with the task of working with pilot districts and schools to implement PBIS and document student benefits. The results of this initial, small scale, effort were encouraging. After 3 years, 65 schools across five districts were documenting that they had adopted PBIS and were implementing with adequate fidelity. Participating districts were able to build the training, coaching, data analysis, and leadership capacity needed for sustainability. Student outcomes in participating schools indicated (a) reduction in problem behavior and improvements in behavior climate, (b) increased rates of attendance, and (c) improved levels of oral reading fluency. Based on these demonstrated results, the state department of education consolidated less effective projects, and used the pilot results to write for additional federal funding. Five years after their initial launch, the district had a combined budget from federal, state, and foundation sources of US$5.8 million per year allocated to their state technical assistance unit for implementation of PBIS to improve the social culture of schools throughout the state. This could easily be a simple story demonstrating leveraging of an initial federal investment in Year 1 (US$1.3 million per year) to gain new federal, state, and foundation investment at Year 5 (US$5.8 million per year). Without the initial investment (and resulting demonstration of success), the later set of investments would have been unlikely. But even this process hides the resources (mostly the time of personnel) in each school that were present in Year 1, but are being used differently (i.e., repurposed) in Year 5 to train, coach, and perform the activities that makeup Tier I PBIS. Leveraging becomes more nuanced with each stage of implementation and more detailed knowledge of the local context. An effective technology of resource leveraging requires delineation of typical resource categories and standards for monetizing those resources. This message is especially relevant as new practices are piloted prior to larger scale implementation. The pilot may be successful at demonstrating that the practice is effective, but typically a pilot includes costs that would make scaling prohibitive. Leveraging resources for large-scale implementation often involves not only accessing new funds and repurposing existing resources but also modifying piloted implementation procedures to achieve economies of scale that make large-scale implementation possible.

Resource Leveraging Measured

Understanding any process typically involves observation, definition, and measurement. We believe that a useful understanding of resource leveraging will require agreement about its definition, development of formal measurement procedures, and repeated observation. Of these steps, measurement may be the most challenging. It may be easy to conceptualize the unit of measure (e.g., U.S. dollars),

but the process of assigning a monetary value to noncash resources, and determining which assets to figure into the valuation, requires a standard set of assumptions. Because the basic logic of leveraging is investment, and changing the level of investment focused on a targeted outcome or initiative, it is reasonable to use dollars (currency) as the unit of measure. Many forms of investment are simple allocations of funds (making the counting of dollars obvious). Other forms of investment are tied to how personnel spend their time, the use of buildings, allocation of materials and equipment, existing professional development events, and the opportunity cost of not doing other valued activities. One New England district, for example, recently shifted allocation of personnel and training resources from a model that involved seven different initiatives focused on social skills, bully prevention, and mental health supports (none of which was associated with clear evidence of positive effects) to a unified, multitiered approach for establishing a positive social culture with targeted and individualized supports for students at risk. The result was not a net increase in resources allocated to improve the social culture in their schools, but a consolidation and repurposing of resources that elevated the support targeting their multitiered approach. This consolidation and repurposing of resources is an illustration of leveraging in which investment in an initial demonstration resulted in a more substantial allocation of resources to the multitiered approach, although a significant proportion of the new support came from reallocation of resources previously allocated to other initiatives.

Economists have long focused on the care needed to assign a monetary value to activities within organizations (Blonigen et al., 2008). The tools for valuing an array of investments and comparing the real value of dollars invested at different points in time (discounting) are important elements of any leveraging analysis. If, however, we can identify (a) an organization, (b) a targeted outcome (or initiative), (c) at least two points in time, and (d) the value of resources allocated to that outcome or initiative at each point in time, there remains the task of defining the final metric to assess resource leveraging. The most obvious approach is to divide the resources at Time 2 by the resources at Time 1. From our example above, if US$5.8 million was invested in PBIS implementation at Time 2 and US$1.3 million was invested at Time 1, then 5.8 / 1.3 = 4.46. The resources at Time 2 were US$4.5 million more than at Time 1 or, framed differently, the resources at Time 2 were 4.46 times the resources at Time 1 (assuming constant dollar value across years). Finding agreement on the specifics of how leveraging is measured and described will open opportunities to ask questions, such as "What level of leveraging is needed to scale a proven practice across all schools in a district/state?" or "How does the initial efficiency and practicality
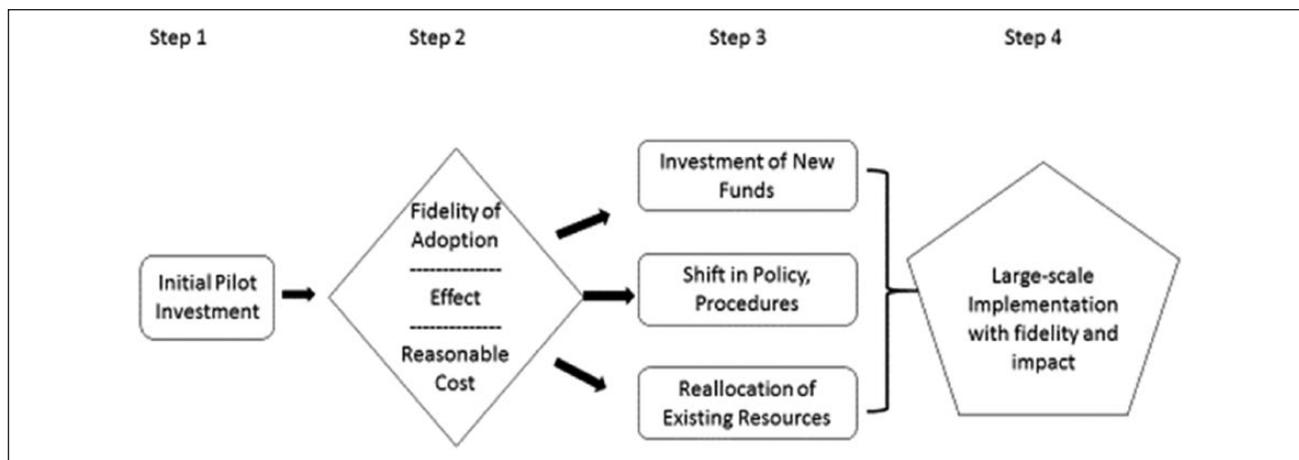
Figure 1. Elements of resource leveraging: Initial pilot investment provides proof of concept that is used to leverage (a) new (larger) funding, (b) policy shifts needed for efficient implementation, and (c) reallocation of existing resources (e.g., full time equivalent).
Note. The result is a large-scale adoption of new practices with fidelity and impact.

of a practice (e.g., ease of use) affect the level of leveraging needed for scaling?"

Our underlying message is that if we are to consider resource leveraging as an important topic for consideration in the field, then educators, policy makers, evaluators, and researchers need to agree on standards related to definition and measurement.

The Mechanism Driving Resource Leveraging

Our collective experience studying human behavior has left us with an appreciation for not only documenting patterns of behavior but also attending to the mechanism(s) associated with change (Cooper, Heron, & Heward, 2007). Any discussion of resource leveraging would be incomplete without some assumptions about how and why the process works. Figure 1 offers a logic model to help guide both discussion and future research. The process begins when initial exploration of options leads a group (e.g., a state department of education) to invest in the implementation of a set of procedures (e.g., PBIS) to achieve a given outcome (e.g., improvement in social and academic outcomes for students). The initial investment, however, is not made to influence the entire state, but only a pilot subset to serve as a proof of concept. The second step in this process is a formal determination of whether the new practice (a) can be implemented as intended (fidelity), (b) results in the valued effects that were promised, and (c) can be adopted at a feasible cost (i.e., fiscal, ethical). The move from Step 2 to Step 3 is the presumed point at which the experience from the initial investment can be used to leverage a larger investment. Our experience is that although national research and demonstration efforts may be sufficient to induce a state or large district to invest in a pilot of some practice, it takes

local experience to spark the level and depth of commitment and investment needed for large-scale adoption. If the evaluation experience at Step 2 can document fidelity, effect, and cost efficiency, the likelihood of investment in larger, more sustained implementation improves.

The mechanism by which this leveraging works is threefold. First, additional funding is required to commit to scaling up a practice or program with demonstrated effectiveness. The level of funding used at Step 1 is typically a useful source of guidance, but the general assumption should be that the per-unit cost will decrease with a scaled effort. Our experience is that an important element when budgeting for large-scale implementation is to adjust not only the amount budgeted but also the timeline for the larger goal. A consistent trap with state implementation efforts is the tendency to budget large-scale efforts within timelines that are insufficient to build the capacity for sustainability (McIntosh, Filter, Bennett, Ryan, & Sugai, 2010).

The second mechanism by which leveraging produces functional effects is in the more subtle modification of policies and standard operating procedures. Policies and procedures facilitate adoption of new practices when they (a) prioritize the valued outcome (e.g., school-wide social culture), (b) stipulate regular measurement (and reporting) of the valued outcome, and (c) document allocation of larger system resources for supporting efforts to achieve that outcome (e.g., provide funding for training and technical assistance). In 2014, for example, the state of California defined school climate as a core outcome measure for schools, districts, and regions within the state, resulting in a rapid and productive shift toward adopting practical solutions to both measure and improve school-wide social culture.

The third way in which leveraging affects large-scale adoption of new practices is through reallocating existing resources. Major organizations (like states and urban

districts) are seldom able to adopt significant, new practices without reallocating some of the personnel, space, time, and dollars they already use for other purposes. Our experience with implementation of PBIS has been instructive. Most schools and districts considering adoption of PBIS have existing strategies for addressing student problem behavior including discipline codes, office referral procedures, and data systems. Adoption of PBIS practices becomes more feasible in these situations when leadership teams agree to (a) never terminate practices that are working, (b) implement the smallest changes that will produce the largest benefit for students, and (c) never introduce new PBIS procedures without defining what the faculty will stop doing to create the needed time. This often results in changing how weekly team meetings are managed; altering the role of school psychologists, counselors, and social workers; and adopting a more targeted protocol for collecting, summarizing, and using data for decision making

Resource leveraging starts with an initial, targeted investment and is dependent on documentation that a new practice is feasible, effective, and cost efficient. The mechanisms by which leveraging affects large-scale adoption of a new practice are (a) garnering access to new funding (especially the funding needed to transition from current to new procedures), (b) prompting the adoption of policies and procedures that ease and encourage implementation of new practices, and (c) reallocation of existing resources (especially in ways that will minimize ongoing costs associated with the new practices).

The Role of Resource Leveraging in the Scaling of Evidence-Based Practices

We believe the importance of resource leveraging is an underappreciated variable affecting large-scale adoption of effective practices. The role and relevance of resource leveraging has become more operational as advocates of implementation science have articulated the four stages guiding implementation efforts (Fixsen et al., 2010): Exploration, Installation, Initial Implementation, and Full Implementation. The Exploration stage is when members of an organization determine whether a practice or initiative is necessary, possible, effective, and practical. This is the time for a team or community to determine whether they are ready to invest not just in a practice but in the valued outcome promised by that practice. The team of decision makers considers the value of what they are already doing and weighs this against the values, skills, administrative support, and resources needed to adopt something new. The central question during the Exploration stage is, "Should we get started on this new path?" The Installation stage involves assembling the capacity to launch implementation. The

training capacity, coaching capacity, and information systems needed for success often need to be linked in a coherent plan before initiating a new practice (Fixsen et al., 2005; Saldana, Chamberlain, Wang, & Brown, 2012). Initial Implementation is the stage where an organization builds demonstrations of a practice being implemented with impact, and simultaneously establishes the organizational capacity to scale up (Aladjem & Borman, 2006; Fixsen, Blase, Timbers, & Wolf, 2001; Schofield, 2004). Full Implementation is the stage where 50% or more units (e.g., schools) in an organization have adopted the new practice. Procedures are focused on establishing the efficiency and regeneration elements needed for continuous improvement, sustainability, and expansion (Fixsen et al., 2001; U.S. Department of Education, 2011).

Resource leveraging is relevant across all stages of implementation. Our experience is that for effective scaling of a practice to occur (a) resource leveraging needs to be considered as part of the readiness assessment and planning completed during the Exploration stage, (b) the Installation stage needs to include practical measurement of resources allocated to achieve implementation, (c) additional resources will be needed for Full Implementation beyond those initially allocated to reach the Initial Implementation stage, (d) the new resources needed for Full Implementation will often come from different sources than those funding Initial Implementation, (e) the process of implementation will need to become more efficient (less expensive per unit across the shift from Initial to Full Implementation), and (f) decisions related to allocation of more and/or different resources toward achieving Full Implementation of a new practice often require data from the Initial Implementation stage indicating that the practice can be adopted with fidelity and produces valued impact (Horner et al., 2014).

Planning for Resource Leveraging

Implementation plans that consider resource leveraging typically include three key features. The first is the designation of a point in time when Initial Implementation efforts can be adequately evaluated. Decisions about resource leveraging should occur when the feasibility of implementing a new practice is apparent. A point in time should be established when evaluation will focus not only on questions about the implementation fidelity and impact of a new practice but about the level and type of resource allocation needed for shifting to large-scale adoption. Building the expectation that decisions about resource leveraging will be needed is an important first step toward achieving that outcome. Points in time should be selected when the impact on valued outcomes should be clear, and the practical costs associated with implementation should be calculable. Horner et al. (2014) report that the point in time when states have been most likely to shift from PBIS demonstrations to

scaled implementation has been after a state could point to 100 to 200 schools actively engaged in PBIS implementation. At this point, a larger team (or set of teams) did not simply expand the established implementation process, but started a new exploration stage with a larger implementation vision. It was at this point that leveraging occurred.

The second key planning feature is to focus Initial Implementation efforts not just on adoption of a new practice but on building the organizational capacity (e.g., training, coaching, policy, organization, data systems) that makes larger scale implementation easier and cheaper. During the Initial Implementation stage, an organization often relies on external sources (e.g., consultants, national experts) for training and coaching, existing recruitment and operating policies, and inadequate data systems. As part of the Installation and Initial Implementation stages, new data systems are adopted, local trainers and coaches are established, and more efficient organizational policies and procedures are defined. As an example, a district or state that moves into Full Implementation will often shift training events for school teams from infrequent, large, congregated events delivered by expensive experts to frequent, distributed events provided locally by district or state trainers and adapted to local community norms. Similarly, well-established steps in the implementation process and access to local, exemplar schools make adoption easier, faster, and less costly (McIntosh, Kelm, & Canizal Delabra, 2016; Rogers, 2003). The importance of this process is that at a point in time when decision makers are considering large-scale implementation of a new practice, they should consider how implementation efficiencies gleaned through Full Implementation of demonstration efforts can reduce the expense per school required for Full Implementation during a large-scale effort.

The third key feature is to plan for shifting sources of resources needed for leveraging. The classic example in education is to provide 2 to 5 years of funding for federal or state projects to transform how effective practices are used. The project funds are received from an external source (often the federal government) and are viewed as supplemental resources to cover transition costs. Too often this approach results in projects that use new funding to add new personnel to the system, have brief effects, and then return to prior performance outcomes upon withdrawal of the supplemental funding and the associated personnel (Adelman & Taylor, 2003; Klingner, Boardman, & McMaster, 2013). A central notion within a resource leveraging approach is that initial investment may be used more profitably to enhance the capacity and impact of current personnel and systems. Initial investment is most often conceived of as transitional in the sense that it should be used to support the transition from one approach to another. Investing in the training, redeployment, and systems resources (data-systems policies) needed to establish the new practice is more likely to establish the capacity and impact needed for sustainability and scaling. Investing in additional personnel elevates the net cost to the system and is unlikely to produce sustained effects once the extra, transitional resources are expended.

From our experience, the resources needed for sustained and scaled efforts seldom come from the same source as the funds that allowed initial stage implementation. Sustained and/or scaling resources are much more likely to appear in the form of (a) reallocating existing personnel time; (b) repurposing materials, data systems, already available space, transportation, and management resources; and (c) extra resources from agencies more local to the host organization (e.g., states, foundations, regions, districts; Horner et al., 2014).

An Example of Resource Leveraging

To frame the role of resource leveraging, we provide a somewhat oversimplified summary of two districts that exemplify our experience with several states and districts over the past decade. Assume that each district is composed of approximately 50 schools with a typical distribution of elementary, middle, and high schools, a population of approximately 30,000 students from diverse backgrounds, and a state department of education that required some form of planning and reporting related to school-wide social climate. Each district was successful in obtaining funding from their state, as part of a federal project, at a level of approximately US$250,000 per year, for each of 3 years to establish multitiered behavior support. Each district established a district leadership team, utilized Exploration stage planning to select PBIS as their initiative focus, and built a plan for installation and initial implementation. The two districts also mirrored each other in their identification of eight to 10 schools to serve as an initial cohort for adoption. School teams were developed and trained by national experts across three or four major training events per year. The teams used the Tiered Fidelity Inventory (TFI: Algozzine et al., 2014) to assess the level of PBIS fidelity, and their local school information system to assess (a) office discipline referrals, (b) attendance, (c) suspension/expulsion, and (d) school climate.

After 24 months, both districts had documented success in their initial cohort schools. The schools were implementing Tier I PBIS at adequate fidelity of implementation as documented by their TFI scores, and the student outcomes were indicating reductions in problem behavior, improved attendance, and elevated levels of safety and school climate as rated by students. Informal student reports described a reduction in bullying. After 3 years, the two districts were each viewed with admiration for their overall success.

Two years later, one district's growth was stagnant, while the other had scaled up PBIS. The first district still had eight schools implementing Tier I PBIS, with six

maintaining adequate fidelity. The second district had 44 of their schools implementing PBIS, and these schools had extended implementation beyond Tier I to Tiers II and III. Although many variables may have contributed to the divergence in these implementation stories, we believe one major contribution lies in the effectiveness of the second district to leverage their initial investment. The second district used the success they documented in their first 2 to 3 years of PBIS implementation to argue for (a) another 3 years of support from their state (albeit at a lower level); (b) development of district trainers who were able to train new school teams in PBIS Tier I; (c) support for the use of school psychologists, counselors, and social workers in new roles as instructional and behavioral coaches; (d) development of district policies for selecting new staff with a focus on multitiered systems, redefining the role and opportunities for building administrators, and supporting school teams (e.g., protection of team meeting time, training in team problem solving, ensuring team access to fidelity and student outcome data); (e) investment in data systems that facilitated improved local (building-level) decision making; and (f) modification in the design and content of their existing district professional development efforts. The second district used their district leadership team to align each of the different efforts in the district focused on the social behavior of students. This alignment process resulted in then termination of two initiatives and the formal linking of school personnel and administrator training on PBIS, bully prevention, mental health services, and restorative practices efforts.

The cost in the initial 2 years to implement PBIS to Tier I fidelity in the initial nine schools in the second district averaged US$12,000 per school above the standard, per school budget. The cost for additional new schools in this district to adopt PBIS at Tier I dropped to an estimated US$5,000 per school of external funds. The improved efficiency was due largely to the fact that standard district and building funding categories were allocated for district trainers, coaches, data systems professional development, and behavior specialists engaged in PBIS implementation. We believe that the difference between these two stories of PBIS implementation lies in large part with the effectiveness of the district administrators and leadership team in the second district to leverage their initial investment.

Summary

Documented advances in education will extend to a significant proportion of the 95,000 schools in the United States only if we become more skilled at scaling effective practices. Too many impressive instructional, classroom, and administrative practices have been developed, empirically validated, and piloted, only to be left unrequited. We believe that as education becomes more sophisticated in understanding and

using implementation science, one piece of the puzzle will be appreciation for the role of resource leveraging.

We propose that the leveraging of resources becomes a regular focus of all implementation efforts. Measurement of leveraging should become part of the evaluation requirements for federal and state implementation grants. Implementation plans developed by districts and states should include not just the steps for achieving initial implementation but also the anticipated additional funding, policy adaptations, and resource reallocations needed to take the new practice to scale. State and federal technical assistance units are well positioned to facilitate this process.

We also encourage the systematic study of resource leveraging. Districts and states throughout the nation are continually engaged in adoption of new practices and, in many cases, these practices are well-conceived, effective, and practical. However, in too few cases are these practices adapted to the local communities, sustained, and scaled. The study of any new content area typically begins with observation, measurement, and theory development. We hope our experience with PBIS may serve to launch larger consideration and attention to the potentially productive understanding of resource leveraging for improving education in the United States.

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