Statewide Implementation and Scale-Up of Evidence Based Practices for Autism in Education: From Sea to Shining Sea

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Abstract: Although evidence-based practices (EBPs) for autism exist, challenges occur when implementing them in schools. Efforts are taking place nationwide to integrate EBPs into classrooms and bring them to scale. Using an implementation science framework, examples from North Carolina and California will be shared, including facilitators and barriers encountered and lessons learned. Implications for additional cross-state collaboration and future research will also be discussed.

With the explosion in cases of autism spectrum disorders (ASD) over the past twenty years, the demand on public education systems to quickly develop the scope and quality of school services available to address the needs of this growing population of students has increased considerably. This increased demand for high-quality programs and services resulted in the need for better methods of training educators in the use of evidence-based practices (EBPs). The most recent estimates from the Centers for Disease Control indicate 1 in 54 children are affected by ASD (Baio et al., 2018). This means the number of children with this diagnosis served by public schools has grown six-fold- from 93,000 in 2000 to 576,000 in 2015-across the last two decades (Kena et al., 2015).

Several systematic reviews have been completed to identify EBPs for ASD (National Autism Center, 2009, 2015; Odom et al., 2010; Wong et al., 2014; Steinbrenner et al., 2020). The National Standards Project (NSP) identified 11 categories of interventions as “established,” and the National Clearinghouse on Autism Evidence and Practice (NCAEP) identified 28 focused intervention practices for ASD (National Autism Center, 2009; NPDC, 2014; NCAEP, 2020). These independent reviews had overlap in their respective findings, indicating strong support for efficacious interventions for ASD. The findings made a significant contribution toward overall dissemination of EBPs for ASD; however, the limited information on school-based use indicates EBPs for ASD may not be easily integrated into educational programs (Hess et al., 2008; Morrier et al., 2011; Stahmer & Ingersoll, 2004; Suhrheinrich, 2011) or, when used, are implemented with limited fidelity (Suhrheinrich et al., 2013; Suhrheinrich et al., 2007).

In response to this gap, there have been urgent calls for the development and testing of implementation interventions to facilitate
successful uptake and sustained delivery of EBPs for ASD in schools and community programs. Both the Interagency Autism Coordinating Committee Strategic Plan for ASD Research (2013) and the Institute of Educational Sciences (IES) prioritized identifying and targeting mechanisms of successful EBP implementation to maximize public health impact.

Multiple factors support successful implementation across providers, organizations and systems levels. For example, research indicates that successful training in the use of EBPs requires both didactic information and competency training (Joyce & Showers, 2002). Information sharing, or basic workshop training, is not enough to result in implementation, but incorporating coaching, performance feedback, program evaluation, facilitative administrative practices, and methods for systems interventions increase the likelihood of successful uptake of EBP within community programs significantly (Fixsen et al., 2005). Beyond initial implementation of EBP, scaling up interventions across multiple school sites, districts, and regions presents an additional challenge. Most state-wide systems have very limited capacity for scaling up interventions in ways that lead to meaningful improvements in outcomes for students (Fixsen et al., 2013), indicating a clear need for continued development and resource sharing in this area.

Aims
The purpose of this paper is to describe how two states on opposite coasts have begun to address the need for EBP training and use within public education using implementation science frameworks. In each location, implementation science has provided a framework for exploration, preparation/planning, implementation and sustainment/scaling to take place. Using the implementation science framework, we will share our journeys as purveyors of these statewide efforts thus far and provide readers with an opportunity to draw from our experiences with EBP implementation. In addition to the descriptions of implementation activities, we will outline the various facilitators and barriers we have encountered through examples and data using qualitative and quantitative methods.

Method
Exploration
In California, exploration began in 2006 with the development of a Legislative Blue Ribbon Commission (BRC) on Autism. This appointed group of stakeholders from across the state was charged with identifying the challenges being encountered as a result of the rapid increases in ASD diagnoses. Furthermore, they were asked to explore solutions and develop recommendations for overcoming these challenges. Over the course of 12 months of facilitated stakeholder meetings, the BRC developed recommendations that were published in 2007 in a report titled *The California Legislative Blue Ribbon Commission on Autism report: an opportunity to achieve real change for Californians with autism spectrum disorders*. This report provided a blueprint for California to follow for the next several years that outlined the key issues and possible solutions to these challenges. Some of the key recommendations from the BRC included: 1) Identifying and using an agreed upon set of evidence based practices across service systems, 2) Develop a clearinghouse/website where providers and families could go to access vetted information and resources, 3) Develop a plan for systematically training educators in the K-12 system how to use the EBPs effectively, and 4) Develop cross agency memorandum of understanding and/or interagency
agreements to seamlessly support families through service transitions that occur at age 3 and at age 22.

In North Carolina, in response to the growing population of students with ASD, the Department of Public Instruction (DPI) recognized the need for increased support within public education. In 2006, the state increased staffing by adding Statewide Consultants for Autism. Subsequently, the consultants conducted stakeholder groups, completed observations, and analyzed data to explore the context and root causes for the unique challenges to providing appropriate educational services for students with ASD. A review of existing literature related to EBPs, principles of adult learning, and system’s change was conducted. Possible solutions were considered relative to the existing structures, supports, and available resources at the local, district, and state level. The complexity of the solutions made it evident that a statewide blueprint was needed to organize this work.

**Preparation/Planning**

In 2008, California began to execute the blueprint and recommendations of the BRC by forming an interagency autism planning group (IAPG) made up of stakeholders from the field of education, universities, developmental disabilities services, and family support agencies. The IAPG made plans, identified resources, and leveraged support to begin implementation efforts. Due to economic downturn, funding dedicated to the efforts to apply the BRC recommendations was limited, so it was critical to make use of existing resources and establish a grassroots effort through in-kind support from participating agencies. The IAPG spent the 2008-2009 school year developing and refining the implementation plans. By the end of the initial development phase, the IAPG made the initial goal to identify and train educators in the proper use of a set of validated EBPs. It was at this time that the IAPG was made aware of the National Professional Development Center of Autism Spectrum Disorders (NPDC-ASD) project through the University of North Carolina at Chapel Hill. In 2009, the IAPG applied for and was awarded two years of training and technical assistance through the NPDC-ASD. Funded by the Office of Special Education Programs, this implementation project provided an established set of EBPs, training tools and resources including online learning modules and fidelity checklists, and a model for California to use as we began our initial implementation work (Wong, 2014). California was awarded this training and technical assistance grant for school years 2010-2011 and 2011-2012.

Preparation and planning in North Carolina began in 2006. A small funding pool was made accessible to school districts for the purpose of increasing capacity for serving students with ASD. Through that resource, many school systems installed autism teams to develop an organizational infrastructure to support the initiative. An extensive professional learning plan was developed with consideration of the need for supports, such as coaching to increase classroom implementation of content. During the planning stage, collaborations were initiated with external partners with a focus on collective impact, including contracting with TEACCH at the University of North Carolina Chapel Hill to create and co-deliver foundational autism training. Throughout the implementation process, a continuous plan-do-study-act cycle led to revisions. Stakeholder feedback was gathered with a particular focus on input from educators and Exceptional Children’s Directors revealing differences in infrastructure, local funding, and personnel. Based on that information and in recognition of the varying levels of
readiness of school districts across the state a multi-tiered support plan was created. This plan allowed all systems the flexibility to choose the level of support needed to address their capacity building with options for accessing professional learning or creating infrastructures to pair professional learning with ongoing support for increased classroom implementation. In 2017, the implementation team revisited the effectiveness of the initiative, resulting in planning a more targeted approach launched at four usability sites, “model sites.” The planning and preparation for this iteration of the initiative more intentionally addressed readiness in terms of implementation drivers, use of data sources and fidelity tools, and a more comprehensive approach to installation of the coaching component.

Implementation

Beginning in September of 2010, California implemented their training and technical assistance model (Figure 1) in six “demonstration sites” over the course of the 2010-2011 and 2011-2012 school years (see Figure 1). The “demonstration sites” each applied for the training and technical assistance offered through the project using an application established by the IAPG. Programs earned points for having existing infrastructure in place that would support immediate implementation of training and coaching practices outlined in the NPDC-ASD protocol. In an effort to learn how the model could be used in a variety of contexts, the IAPG selected programs from across the grade levels and across the spectrum of student needs. After a successful two-year partnership with the NPDC-ASD and outcomes indicating that the model was effective, feasible and also a good fit for California, the IAPG began making plans to further disseminate the model beyond the original “demonstration sites.”

The California Autism Professional Training and Information Network (CAPTAIN) was established following the two-year project to scale up the NPDC-ASD model and train trainers across a massive and diverse state. This was accomplished by working with intermediary entities, including the Special Education Local Plan Areas (SELPAs), Regional Developmental Disabilities Centers (RDCs) and Family Resource and Empowerment Centers (FRC/ FEC). These intermediary groups selected individuals to become trainers for CAPTAIN (called CAPTAIN Cadre). Criterion to become a trainer included: 1) Prior knowledge of and training in Autism and related EBPs, 2) Demonstrated ability to provide high quality training and coaching, and 3) Ability within their job role/function to provide the required training and coaching to at least 3 programs/teachers per year. CAPTAIN leaders, who were all members of the IAPG and/or were staff members from the six NPDC – ASD demonstration sites provided training and technical assistance to help newly appointed trainers learn the NPDC-ASD model and proper usage of their resources including the online learning modules and fidelity checklists. CAPTAIN leaders also provided training to new Cadre in the NPDC-ASD coaching methods and practices as outlined in the NPDC-ASD Coaching Manual (Kucharczyk, 2012). The initial training for Cadre members was conducted at an annual CAPTAIN 2-Day summit with ongoing support provided through local collaborations and quarterly meetings. In order to house all of the EBP training resources, CAPTAIN worked with the California Department of Education (CDE) to develop a website that would become the clearinghouse for ASD-EBPs for the state of California (www.captain.ca.gov). This website has links to vetting resources and information about how districts can receive EBP support through CAPTAIN.
Similar to California, a primary goal in North Carolina was to increase educators’ implementation of EBPs in order to improve services and outcomes for students with ASD. In 2015, a professional learning plan was implemented that provided foundational knowledge and skills. Initial content provided by state consultants in collaboration with external partners focused on antecedent based intervention, visual supports, and self-management, while leveraging available online content for a broader array of EBPs through Autism Focused Intervention Resources and Modules (AFIRM). Through ongoing needs assessment, trainings were added to address foundational concepts of communication including augmentative and alternative communication and behavior analytic instruction which addresses task-analysis, prompting, and reinforcement within a context of standards aligned explicit instruction. Workshops incorporated multiple methods of delivery, including didactic training, modeling, and practice with feedback. Although fidelity tools were shared with training participants and autism teams, the initiative lacked a plan for systematic use of fidelity instruments. The model sites component of the framework includes an accountability component for measurement of fidelity that can inform the larger project moving forward.

Concurrently, the existing autism teams from school systems across the state were trained in effective teaming, strategic planning, and methods to provide ongoing support, in order to address the theory-to-practice gap. While continuing to support the breadth of training needs across the state, a comprehensive pilot began in 2017 in four school districts that included more intentional delineation and application of program evaluation, data analysis, assessment of organizational, leadership, and competency drivers. Within the revised framework, accountability mechanisms include an array of tools to ensure fidelity of implementation.

Scale Up/Sustainment
Scaling up the use of evidence-based practices involves a conscious and systematic endeavor to bring these practices to more and more students, districts and implementers. According to Fixen et al. (2009), scale occurs when 60% or more of students who could benefit from an innovation are experiencing that innovation in their educational setting.
(Fixen et al., 2009). In California, CAPTAIN has been training and supporting its Cadre, since October 2013. Presently, there are 412 active cadre members from three primary agencies (SELPAs – 93% participation, RCs – 100% participation, and FRC/FECs) who disseminate information on ASD and EBPs, conduct local trainings, provide implementation coaching for teachers, and work within regional implementation teams to support the use of EBPs across California (Table 1). Cadre members have annual training and coaching requirements that they must fulfill to remain members in good standing. All Cadre convene annually for updated training and regional teams meet quarterly to share resources and implement regional plans. Cadre are supported with funding by their agencies for their participation in CAPTAIN related activities. The CAPTAIN leadership team provides regional support and holds an annual CAPTAIN Summit where new policy and practice are shared with the Cadre. Due to inevitable attrition, new Cadre are identified and trained annually at “Bootcamp”, which takes place prior to the yearly summit. This orientation training allows new Cadre to learn about the NPDC-ASD model and pick up tips from more experienced Cadre on how to carry out their training and coaching requirements. New Cadre receive ongoing support through contact with veteran Cadre within their region.

Throughout the implementation process in North Carolina, consideration has been given to sustainability and scale up. The foundational professional learning offerings are available annually, with new content development providing access to a wider range of EBPs each year. As previously discussed, the state support plan provides districts the opportunity to select a level of support. General support provides access to funding to support professional learning access. 169 school systems are currently accessing support through the statewide framework (Table 2), which represents 80% of the state. Of those 99, or nearly 70% having an autism support team established. These teams will continue to provide ongoing support within their LEAs. Many of those teams are growing in their capacity to provide effective professional learning at the local level. The teaming structure aspect of the model is already scaled up, as it is available to all school systems in the state. The model site component, currently installed in four school systems will be scaled up to provide for one model site in each of the eight educational regions in the state. The model site teams are being trained in effective design and delivery of professional learning to adult learners, which will increase the number of people able to provide professional learning and support across the state. This trainer of trainer’s aspect will

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<td>360</td>
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<td>15</td>
<td>19</td>
<td>19</td>
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<td>22</td>
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<tr>
<td>Total Cadre</td>
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<td>450</td>
<td>426</td>
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Table 2
North Carolina LEAs Accessing Statewide Support

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<tbody>
<tr>
<td>Autism Support Teams</td>
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<td>109</td>
<td>128</td>
<td>102</td>
<td>99</td>
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<tr>
<td>General Support</td>
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<td>N/A</td>
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</tr>
<tr>
<td>Total LEAs</td>
<td>103</td>
<td>109</td>
<td>128</td>
<td>140</td>
<td>169</td>
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support the sustainability and scale-up of the model at large.

**Results**

**Identified Facilitators and Barriers**

In California, part of our continuous improvement cycles involves the implementation of an annual cadre member survey, which asks questions related to their needs, outputs, impacts, and the facilitators and barriers they face. This annual survey has provided us with invaluable information for ongoing improvement of our model. Figure 2 outlines the identified barriers cadre reported encountering the most during the 2018-2019 school year.

In response to the identified barriers, CAPTAIN leaders and their Cadre are now required to meet annually with agency directors to review the perceived barriers and the training and coaching plans for each agency. It is during these meetings that often systems level changes are suggested to help improve barriers such as staff time/availability to provide training and coaching as well as methods for securing release time and subs. Agency leaders also

Figure 2
Barriers Reported by CAPTAIN Cadre Related to Training and Coaching Efforts

- Time for Training: 73 (%)
- Time for Coaching: 52 (%)
- Staff Buy-In: 42 (13.6 %)
- Substitutes/Staff: 32 (%)
- Budget/Funding: 26 (%)
- Foundational Skills: 21 (%)
- Admin Support: 16 (5.2 %)
- Staff Turnover: 16 (%)
- Challenges w/ Union: 10 (%)
- Lack of Resources: 6 (%)
- Complexity of EBP: 5 (%)
- Role does not allow for training/coaching: 3 (1 %)
- Other: 3 (1 %)
must review their selection of Cadre each year in order to determine if the identified Cadre is the best fit for the role. In addition, Cadre are required to meet regularly with their local teams and direct supervisors to develop improvement plans that can shape local activities. In order to help the Cadre learn new methods to address staff buy-in, workshops have been provided on motivational interviewing. The analysis of barriers and facilitators and improvement cycles to address them is ongoing and continues to be a primary part of what the CAPTAIN leadership team is working to address.

In 2017, a problem analysis process was conducted during the exploration stage of the North Carolina project that yielded a number of barriers which continue to be present. Attrition of special education teachers at the school and local district level creates a constant need for skills development in the area of services for students with ASD. Attrition also impacts progress of autism teams due to time spent onboarding new members. Although there is a great need for professional learning, educator participation in these offerings is voluntary. School systems choose whether to participate in the supports provided by DPI at the state level. Currently, 20% are not engaging. Even within school systems that are actively involved, site-based management at the school level allows for some educators to be excluded. Effective coaching requires allocation of personnel and time, both of which are in high demand in North Carolina schools. A lack of dedicated personnel at the school district level impedes fidelity of implementation in coaching. However, despite the range of barriers identified, they are counterbalanced by several facilitators. One, which is unique to the state of North Carolina, is employment of four statewide consultants under the DPI who assist educators serving students with ASD. Additionally, the efforts made to establish teaming structures at the local system level have resulted in 70% participation by North Carolina school district. Lastly, North Carolina is home to several nationally recognized agencies that have extensive expertise in research and innovation in the field of autism with whom we partner. These collaborative partnerships have supported the implementation efforts to move forward and scale up.

Discussion
While the implementation plans, and models rolled out in California and North Carolina are different, there are many common elements. In addition, the lessons we have learned are strikingly similar. What follows is a description of the lessons learned as a result of our implementation efforts.

Go Slow to Grow
Implementation science delineates the importance of stages of implementation. Within that, it is clear that much work must be accomplished prior to attempting to implement or scale up a new initiative. In both states, we can cite several prior initiatives that were rolled out on a large scale with limited success. In examining the effectiveness of those initiatives, our teams realize that what was lacking was intentional exploration and planning and too great a rush to go full scale with implementation. When implementation is rushed, important factors can be missed. It is far more effective to spend time on the exploration and planning phases and then install in locations that exhibit proper readiness.

Leadership Is Everything
Leaders can impact the available capacity to foster change and innovation. The role of “first-level” leaders, those who supervise individuals providing direct services, is
particularly critical to organizational effectiveness and to the use of EBPs. These leaders are in a position to facilitate implementation of EBPs, including the development of organizational structures and processes for EBP sustainment and scale-up. Additionally, they are able to effectively advocate within the larger system to acquire the needed resources to implement and sustain an initiative. It is important to identify and develop leaders who understand these leadership drivers and the role they can play in effective implementation and scale up.

Coaching is Hard but Necessary
Research shows that active coaching is a necessary component for change in classroom practices to occur (Joyce & Showers, 2002). In order to create an effective coaching model, it is necessary to select the right people to serve as coaches and ensure that there is dedicated and protected time to allow for coaching. Coaching is intricate, involving both explicit coaching skills as well as an array of relationship building and communication skills. Finding great coaches requires strict selection as well as training and coaching of the coaches for them to effectively support classroom staff in a highly effective way.

Sustainment Requires Organization and Systems Change
Organizational drivers are critical to implementation. An initiative does not stand alone; it is one of many things happening within an organization or system. As such, in order for it to be sustainable, it needs to be incorporated into the organization or system. This involves effectively mapping its relationship to existing initiatives as well as leveraging and sometimes redefining roles and resources. In analyzing necessary resources, the potential contribution of internal and external partnerships should not be overlooked.

Flexibility is Necessary (Within Reason)
Establishing a solid framework and model is important. There are changes that happen that are often beyond our control. Thus, flexibility is an integral part of implementation and of establishing sustainability. Schools are dynamic organizations and adjustments may be necessary within each school district to meet the expectations of an initiative, such as redefining roles and/or reconsidering priorities in alignment with existing initiatives. Reactions to changes on various levels should always be measured against the overall vision and goals to ensure that teams do not lose focus on the important work of improving outcomes for students with ASD.

You Are Not Alone
The work of statewide capacity building to support educators’ implementation of evidence-based practices for students with ASD can be daunting. We need a community of practice to support this work. Through the relationship formed between California and North Carolina, we identified similarities related to implementation practices, barriers to effecting change, and challenges with scale-up and sustainability. This collaboration has allowed us to share successes and missteps, solutions to barriers, as well as resources and expertise. Connecting with and learning from each other has been and continues to be valuable to both states. At the time of this publication, there is no readily accessible resource that serves as a directory for individuals supporting this state level implementation work across states. The work is housed in different agencies, from institutes of higher education to state education agencies to the various other state departments such as the Department of Health and Human Services. We have learned that we are not alone, and
neither are you. In order to facilitate increased collaboration among those who engage in similar work, we are in the process of creating a national network of statewide implementers, the National Autism Network of Statewide Implementers (NANSI).

**Recommendations**

Purveyors of EBP implementation have an arduous task in developing models that result in effective and sustained use of EBPs within public education contexts. It is fortunate that many are documenting their implementation methods and have identified, through qualitative and quantitative methods, the facilitators and barriers to their success and the lessons learned in order to suggest potential improvements. This paper summarizes the experiences of two state implementation models from opposite sides of the country who have undertaken this challenge. Although the models are different based on state and local needs and contexts, many of the key findings and lessons learned from each respective state are the same. These examples can be used by others to help shape similar large-scale implementation projects. Reviewing the lessons learned, there is a strong connection to critical components of implementation science; therefore, both teams emphasize the need for this work to be approached systematically from that framework.

Finally, the projects outlined in this study are not research studies. Rather, they are case examples of efforts to take EBPs and models of implementation and deploy them at a statewide level. Ideally, information from our case examples could help to inform future research studies that will provide a more definitive path for how to bridge this research to practice gap.

**References**


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