



A Summary of Professional Development Research

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Summarized by Robert Ochsendorf
and Katherine Taylor

Introduction

The National Center for Special Education Research (NCSER) supports research that contributes to the identification of effective strategies for improving the performance of current teachers and other instructional personnel, and related services providers in ways that increase student learning and achievement, social and behavioral skills, and high school transition outcomes for students with or at risk for disabilities. Most students with disabilities (95%) are educated in general education classrooms for at least some portion of their school day, with more than half of all students with disabilities (61%) educated in the general education classroom for most of the school day (Snyder & Dillow, 2015). Thus, general and special educators share educational responsibilities for students with disabilities. In the most recent Schools and Staffing Survey nearly two-thirds of the public school teachers surveyed indicated that they had not received professional development during the previous year focused on how to teach students with disabilities (U.S. Department of Education, 2013). Research to support teachers working with students with or at risk for disabilities is critical to ensure students' optimal education outcomes.

Analyses of longitudinal data from Florida by Tim Sass at Georgia State University indicate important implications for preparing teachers for educating students with disabilities. This research found that pre-service preparation in special education has statistically significant and quantitatively substantial effects on the ability of teachers of special education courses to promote gains in achievement for students with disabilities, especially in reading. In particular, certification in special education, an undergraduate major in special education and the amount of special education coursework in college are all positively correlated with the performance of teachers in special education reading courses (Sass & Feng, 2013).

Research that NCSER has funded since 2010 has focused primarily on the development and testing of professional development interventions for in-service teachers in early childhood and K-12 settings. Despite being focused on in-service teachers, much of this research is relevant and important for pre-service teacher training as well.

Research on adult learning has highlighted the importance of four elements for professional development to be effective for improving teacher-related outcomes. Specifically, the research suggests that professional development: (a) be learner-centered, building on individual teachers' strengths and needs; (b) address important content knowledge; (c) provide individuals with opportunities to test their understanding by trying things out and receiving feedback; and (d) occur within a collaborative environment (Bransford, Brown, & Cocking, 1999). This framework highlights the importance of individualized work with teachers that focuses on content knowledge and effective pedagogy within an identified domain (e.g., literacy, mathematics) as critical for professional development. There is also evidence that brief workshops are ineffective in promoting lasting changes in instruction, a finding that is consistent with this framework on professional development and adult learning (Zaslow, et al., 2011). The professional development interventions that have been funded by NCSER reflect this framework by focusing on targeted, individualized work with both general education and special education teachers of students with or at risk for disabilities (e.g., through individualized coaching, mentoring and/or consultation) to promote content knowledge, to provide ongoing opportunities for teachers to try out new approaches to instruction and classroom management, and to receive feedback on their teaching.

Below we present highlights of NCSER-funded research that targets teacher data-based decision-making; content area professional development in language, reading and math; professional development for early childhood teachers; professional development for teachers of children with autism spectrum disorders; and tools for evaluating special education teachers.

Data-Based Decision Making

There are an increasing number of educational data-management systems being adopted by districts across the country to help school personnel collect and use school- and student-level data to inform instruction and behavioral programming and improve student education outcomes. Improvement in the academic and behavioral outcomes of students will require not only appropriate data management systems, but practical procedures for using data in daily problem solving. Using data effectively and efficiently can be a difficult task - teachers often report that they are unprepared to choose and apply reliable strategies for data collection and make good use of data in their deliberations about how to best support student learning (Means, Padilla, DeBarger, & Bakia 2009; Murray, 2013). Several NCSER-funded projects are addressing this problem at the team-level by developing and testing professional development programs to assist school teams in collecting, analyzing, and using data to inform decision making. For example, Robert Horner and colleagues at the University of Oregon have developed a training and coaching model for teaching teams of school staff to use behavioral and academic progress-monitoring data to define and solve problems. The model has promise for improving student outcomes, and these researchers are rigorously testing this approach and examining impacts on student academic and behavioral outcomes in a randomized controlled trial. Another professional development intervention developed by Elizabeth Doll and colleagues at the University of Nebraska focused on preparing special education teams to use data-based decision making to improve academic outcomes for students with disabilities in K–12 classrooms.

Other NCSER-funded projects are developing and testing programs aimed at improving individual teachers' use of data to improve student outcomes. Julie Owens at Ohio University is developing a program to improve the fidelity of teacher implementation of a daily report card intervention, which is designed to improve the frequency and quality of behavioral data for students with or at risk for ADHD. These data-based decision-making skills are increasingly important for experienced teachers as well as those just entering the profession as more data are available to inform instructional decisions and ultimately optimize student progress. Julie Alonzo at the University of Oregon is developing an individualized web-based professional development program aimed at improving teachers' implementation of Response to Intervention (RTI) and student outcomes, by enhancing teachers' ability to make instructional decisions based on their students' progress data.

Instructional Strategies for Teaching Subject Area Content

NCSER has funded a number of projects focused on improving the quality of professional development provided to teachers and instructional personnel of students with or at risk for disabilities. Mary Brownell at the University of Florida developed a program to improve literacy instruction via collaborative professional development groups. This program was shown to have promise for improving teachers' integration of strategy knowledge and use in literacy instruction (Brownell, et al., 2013). In a related effort, Jade Wexler at the University of Maryland, College Park, is developing a systematic co-teaching model to improve content-area knowledge and basic reading skills of students

with disabilities. Jim Knight at the University of Kansas developed a partnership instructional coaching model to identify and foster attributes of strong coaching associated with improved student outcomes in science and social studies (Knight, 2007). Anne Foegen and colleagues at Iowa State University developed a professional development program that included online instructional modules to train teachers to use three types of algebra progress monitoring measures, and online tools for scoring and data management to support teachers' scoring of the measures. With research showing that success in algebra is predictive of high school graduation rates and postsecondary success (e.g., college enrollment, lifetime earnings), this type of support for teachers is critical to assist students with disabilities who struggle in this subject (Impecoven-Lind, & Foegen, 2010).

Researchers are also using technology to improve professional development in subject area content. For example, Thad Starner at Georgia Tech has developed a smartphone-based application to deliver instructional videos of American Sign Language to hearing parents and teachers with the goal of improving early literacy outcomes for deaf children. Another NCSEF-funded project, led by Cynthia Griffin at the University of Florida, developed an online professional development program, *PRIME Online*, to improve the pedagogical content knowledge of general and special education teachers of mathematics in the elementary grades. *PRIME Online* includes a series of 20 online professional development modules that address standards-based mathematics content, pedagogical content knowledge for teaching based on explicit strategy instruction, the needs of students with learning disabilities included in general education mathematics classrooms, and the use of progress monitoring assessment practices.

Instructional Practices in Early Childhood Education

In the area of early childhood education, NCSEF-funded researchers are working to better understand how to optimize professional development interventions for early childhood teachers of students with disabilities. For example, Patricia Snyder at the University of Florida is helping teachers improve upon the use of “embedded instruction,” which promotes learning in the context of ongoing, naturally-occurring activities, routines, and transitions in the preschool classroom. As part of their professional development program called *Tools for Teachers*, preschool teachers receive professional development training that includes the use of videos for modeling practices and assessing teacher implementation, along either in-person or web-based coaching. *Tools for Teachers* has demonstrated feasibility of implementation in authentic preschool settings as well as promise for teachers’ implementation of embedded instruction and improving developmental and school readiness outcomes for young children with disabilities (Snyder, Hemmeter, McLaughlin, Algina, Sandall, & McLean, 2011). The efficacy of the intervention is currently being tested.

In another set of studies focused on early childhood teachers, Maureen Conroy and colleagues at the University of Florida have developed and are testing the efficacy of *BEST in CLASS (BiC)*, a program designed to increase teachers' use and quality of specific behavioral and instructional strategies, provision of positive attention, general classroom management skills, and sense of self-efficacy to enhance the quality of teacher-child relationships and the classroom environment. This program combines evidence-based behavioral strategies with a coaching model designed to optimize implementation by teachers of preschool-age children. *BEST in CLASS* has demonstrated feasibility of implementation by early childhood educators as well as promise for preventing and ameliorating problem behaviors demonstrated by high-risk children in early childhood settings (Conroy et al., 2015).

Conroy is currently developing a web-based version of the program (*BiC-W*) and also testing the efficacy of *BiC* in a cluster randomized controlled trial.

Instructional Strategies for Students with Autism Spectrum Disorders

Training for teachers and other instructional personnel responsible for educating children with autism spectrum disorders is critical, given the prevalence of children with the disorder (1 in 68 children) and the effects of autism on multiple domains (Centers for Disease Control and Prevention, 2014). NCSER has funded several research projects focusing on improving the skills of teachers of students with autism. For example, Aubyn Stahmer and colleagues at the University of California, San Diego developed *Classroom Pivotal Response Teaching (CPRT)*, a one-to-one intervention program for students with autism. In CPRT, teachers provide a child with multiple cues using student-preferred materials and immediate reinforcement contingent upon the child's response with the goal of teaching various skills and behaviors to elicit the most appropriate response. *CPRT* involves a professional development program that consists of intensive didactic instruction and coaching over a month with continued observation and coaching during the academic year. This teaching program has shown promise for increasing targeted teaching components and student engagement and is now undergoing rigorous testing with teachers from preschool through fifth grade in a randomized controlled study (Stahmer, et al., 2010).

In an experimental study, Phillip Strain at the University of Colorado, Denver evaluated a program for children with autism, *Learning Experiences – An Alternative Program for Preschoolers and Parents (LEAP)*, that included professional development and found positive impacts in the areas of child cognition, language, social skills, and symptom severity when compared to a reduced model without the professional development component (Strain and Bovey, 2011). LEAP professional development for teachers involves a two-year training and mentoring relationship, which includes a two-week intensive teacher training, written presentations, discussions, observations, feedback, evaluation, follow-up training, and on-site support. NCSER is currently supporting a follow-up study to examine whether the gains for children receiving the full-scale LEAP (with professional development) persist three years after the intervention ends and whether there are positive impacts in additional areas (e.g., academic achievement).

Samuel Odom and colleagues at the University of North Carolina, Chapel Hill, are evaluating the effect of a widely used professional development model, the *National Professional Development Center on Autism Spectrum Disorder (NPDC)* on teacher and student outcomes. The NPDC is a comprehensive model that is used to train hundreds of teachers within and outside of the United States on the use of evidence-based practices for elementary school students with autism spectrum disorder. The model involves forming a school-level team to assess program quality, use this information for program improvement, develop measurable student goals, link goals to evidence based practices, and implement these practices to achieve student goals. Teachers participate in an online professional development course and an intensive summer workshop and receive individualized coaching and feedback.

Matthew Brock at the Ohio State University is developing a multi-tiered professional development program aimed at improving the instructional strategies implemented by paraprofessionals working with students with autism and/or intellectual disabilities. The aim of this multi-tiered program is to

provide an efficient and promising means to support K-12 paraprofessionals in implementing evidence-based practices.

Tools for Evaluating Special Education Teachers

Evidence suggests that teacher quality is an important predictor of student academic achievement (Goe, 2007; Wayne & Youngs, 2003). As such, it is imperative to provide teacher evaluation systems that identify areas of teacher improvement, support targeted professional development, and promote students' optimal education outcomes. In response to this need, NCSER-funded researchers are working to develop and adjust evaluation systems to address the unique roles and responsibilities of special education teachers. Nathan Jones at Boston University is partnering with the state of Rhode Island to examine the validity of an existing observation system, *Danielson's Framework for Teaching (FFT)*; Danielson, 2007), for identifying effective special education teachers in teacher evaluation systems. Although *FFT* is widely used to evaluate both general and special education teachers, there is no evidence of its validity for the latter. Therefore, results from this project will determine whether the use of *FFT* scores for professional development and personnel decisions is appropriate for special education teachers. Evelyn Johnson at Boise State University is taking a different approach to teacher evaluation by developing and validating a special education teacher assessment system called, *Recognizing Effective Special Education Teachers (RESET)*. *RESET* is grounded in *FFT*, but is specifically designed to evaluate instructional practice delivered to students with disabilities, provide feedback to special educators about the quality of their instruction and ultimately, improve outcomes for students with disabilities.

On the Horizon

Overall, these projects highlight examples of improving the quality of professional development provided to in-service teachers and instructional personnel for students with or at risk for disabilities. In addition, there are important implications for teacher preparation programs, including for example, knowledge of evidence-based programs and practices, instructional skills, the use of student data in making decision on instruction and behavior management, and new technologies available for improving the outcomes of students with or at risk for disabilities.

While NCSER-supported research has made important contributions to developing and identifying effective ways to provide professional development to educators, we continue to encourage research to identify the most effective, adaptive, and resource-efficient strategies for helping teachers to improve the quality of their classrooms and of the instruction that they provide and ultimately student outcomes. Individualized coaching or mentoring has been identified by NCSER-researchers in this summary as an effective way for helping teachers learn new and effective teaching practices. NCSER-funded researchers continue to study the key elements of effective coaching and the frequency and dosage needed to affect reliable, lasting changes in teachers' instructional practices and on student outcomes. NCSER-funded researchers are also working to develop and evaluate individualized professional development interventions; however, as indicated in the research summarized here, more research is needed on professional development interventions that are individually tailored to meet the unique needs of teachers and/or instructional personnel. These researchers also indicate the need to better understand what technologies are effective in supporting teachers' learning and use of new, more effective instruction and ways to use technology to provide more high quality and sustainable

professional development opportunities to more teachers across the country. In addition, because students with disabilities have increased their time in general education classrooms (Snyder & Dillow, 2015), more research is needed for optimal models for general and special education teachers, paraprofessionals, and related services providers and school personnel to work together. NCSER will continue to encourage research in these areas as well as other areas of professional development that are relevant to both in-service and pre-service teachers of children and youth with or at risk for disabilities, birth through high school.

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