

Increasing the use of evidence-based strategies by special education teachers: A collaborative approach

Albert J. Duchnowski^{a,*}, Krista Kutash^b, Susan Sheffield^a, Bobbie Vaughn^b

^aSpecial Education and Child and Family Studies, University of South Florida, 13301 Bruce B. Downs Blvd., Tampa, FL 33612, USA

^bChild and Family Studies, University of South Florida, 13301 Bruce B. Downs Blvd., Tampa FL, 33612, USA

Abstract

This article describes a process developed to increase the use of evidence-based instructional strategies by teachers of students in special education programs in a middle school and high school. The project developed a working partnership between university researchers and parents, teachers and administrators of students in special education programs. The partnership produced manuals for the teachers that outlined effective strategies for teaching reading, encouraging family involvement, providing academic feedback, and engaging in positive behavior support in the classroom. The results of assessing implementation fidelity, implications of the study, and future research issues are presented.

© 2006 Elsevier Ltd. All rights reserved.

Keywords: Evidence-based instruction; Special education; Teacher-made resources

1. Introduction

Increasing the use of instructional strategies that have a strong empirical foundation is proposed as an important factor in improving the educational outcomes of students in both general and special education. For example, the recently enacted *No Child Left Behind Act*, the major law directing school reform in the United States, refers to evidence-based practice 110 times in outlining the federal plan to improve general education (Slavin, 2002) and the first recommendation in the report of the President's Commission on Excellence in Special Education (PCESE) is to develop a culture of results

that should emerge from improved instruction based on research and increased accountability (PCESE, 2002). A recent special issue of *The Journal of Special Education* (Cook & Schirmer, 2003) highlighted a series of research-based instructional practices for children who have disabilities and the literature in special education contains several research syntheses and meta-analyses of evidence-based practices (e.g., Forness, Kavale, Blum, & Lloyd, 1997; Gersten, Schiller, & Vaughn, 2000). However, the consensus in the field is that there is a vast gap between research and practice that is of national concern (Greenwood, 2001) and the failure to implement and sustain the use of effective practices in the classroom has been offered as a major explanation for the poor outcomes for students in special education programs (Greenwood & Abbott, 2001; Landrum, Tankersley, & Kauffman, 2003).

*Corresponding author. Tel.: +813 974 4618.

E-mail addresses: duchnows@fmhi.usf.edu (A.J. Duchnowski), Kutash@fmhi.usf.edu (K. Kutash), ssheffield@fmhi.usf.edu (S. Sheffield), bvaughn@fmhi.usf.edu (B. Vaughn).

Increasing the implementation of effective practices in the classroom by special education teachers is a challenge facing researchers and teacher educators as well as administrators and classroom teachers. The current emphasis on high stakes testing, rising performance standards, and accountability for adequate yearly progress by all students, including those who have disabilities, have made improved outcomes for these students a priority. Researchers and teacher educators are making major contributions toward meeting the challenge through innovative and effective projects aimed at reducing the research to practice gap. For example, the journal *Teacher Education and Special Education* recently devoted a special issue to this topic (Greenwood, 2001). This series of articles contained discussions of relevant issues and reports of empirically tested efforts at increasing the use of research findings by special education teachers. One of the conclusions of this special issue is that there is an extensive literature base describing efforts to reduce the research to practice gap in special education (e.g., Gersten & Brengelman, 1996; Gersten, Schiller, & Vaughn, 2000; Vaughn, Hughes, Schumm, & Klingner, 1998). This literature includes several meta-analyses and research syntheses that inspire continued, systematic research aimed at achieving the goal of increasing research-based practice in the field.

The purpose of this article is to report on the method, implementation, and initial findings from a research demonstration project aimed at reducing the research to practice gap in special education. The development of an overarching partnership between researchers, teachers, administrators, and families to construct and implement a series of instructional strategies gleaned from the empirical knowledge base is presented. The following sections describe the process followed to develop a participatory partnership with key stakeholders as well as the initial results evaluating fidelity of implementation.

1.1. Using a multiparadigmatic approach

While teachers and researchers frequently have differing perspectives about effective practice, a focus on student outcomes has been proposed as central to efforts to bridge this gap (Greenwood & Maheady, 2001). Using this focus as a guide, the adoption of a multiparadigmatic approach to collaboration between researchers and other

stakeholders is seen as a helpful mechanism in producing comprehensive, effective instructional interventions (Kromery, Hines, Paul, & Rosselli, 1996). Such an approach embraces a shared decision-making partnership and allows for effective practice to be understood at the level of both theory and practice (Greenwood & Abbott, 2001). In this way, differences that may exist because of diverse views and theories may be examined and a consensus for action can be reached (Kromery et al., 1996). Project PROMISE (Fuchs & Fuchs, 2001) is an example of such an approach. PROMISE used extensive collaboration between researchers and teachers to choose and implement innovative practices, formulate an evaluation process, and collaboratively evaluate the effectiveness of the intervention (Fuchs & Fuchs, 2001). This strategy was adopted in the current study.

2. Method

2.1. An effective strategies partnership

Because the typical one-shot in-service training model is not considered to be effective in bringing about sustained implementation of effective practices by teachers (Greenwood & Abbott, 2001), a more systematic approach was planned that allows teachers and researchers to work together to identify and implement effective instructional practices that would lead to better outcomes (Vaughn et al., 1998). This strategy requires more time and effort during the initial phase of the project, but our assumption was that it would be more effective in the long run and ultimately more cost-effective in terms of resources needed and outcomes achieved.

This plan to work together was facilitated by our history of collaboration through the existence of a *Professional Development School* (PDS) at each of the schools that participated in this study. A PDS is a model of school–university collaboration that emerged in the 1990s as a strategy for school improvement (Paul, Duchnowski, & Danforth, 1993) and our University has produced an extensive record of PDS implementation over the years (Paul, Epanchin, Rosselli, & Duchnowski, 1996). In our PDS model, a university faculty member from the College of Education was based in a public school for 50% of their assigned time. The faculty member engaged in a variety of activities that were all aimed at improving outcomes for students. These included staff development, student–teacher supervision, and

implementing participatory research with the public school faculty. The agenda for all these activities are developed in a collaborative manner with a committee that is representative of the school staff and the university.

After a period of adjustment, trust and respect between all partners was established and the school improvement agenda advanced. Teachers realized, for example, that the researchers in their schools would not engage in the usual business of conducting their study and then leaving the building, probably never to be heard from again. In a PDS there is continuity of personnel as well as of activity. Furthermore, the type of research that is conducted tends to be more systemic and comprehensive. This type of research is also viewed as being relevant to the teachers.

In this context of collaboration, the authors (researchers) met with special education teachers and administrators from a middle school and high school that agreed to discuss their interest in participating in a project aimed at improving outcomes for their students through the use of evidenced-based practices. A group of parents of children who had disabilities was also convened to discuss the broad concept of the proposed project. All participants were enthusiastic and it was agreed that the researchers would take the lead in writing a proposal for funding. Initial discussions with all the partners identified the areas of reading instruction, formative evaluation, positive behavior support (PBS), and family involvement as the four target areas for the project. Subsequently, a proposal was submitted and funded.

2.2. Participants

There were three types of participants in the study, i.e., schools, special education teachers, and students who were served in special education programs. A middle school and a high school from a suburban/semi-rural county volunteered to participate in the study. The middle school (covering grades 6 through 8) had 1249 students and the high school (covering grades 9 through 12) had 1400 students. The two schools had similar student demographic characteristics with approximately 22% of the students at each school from ethnic minority backgrounds. Approximately 33% of the students in both schools qualified for free or reduced lunch, a frequently used proxy to indicate the level of poverty in a school.

This study focused on special education teachers of students in three disability categories: Specific Learning Disabled who spent 50% or more of their school day in special education classes ($n = 263$), Emotionally Disturbed ($n = 56$) and Educable Mentally Handicapped ($n = 23$). These three categories represent the highest incidence categories in the special education population. The special education teachers at the middle school ($n = 11$) and the high school ($n = 7$) who taught these students volunteered to participate in the collaboration with the researchers in developing the intervention strategies and then implemented the strategies in their classrooms.

2.3. Phase one: developing action plans through the partnership

During the summer, the teachers, an administrator, and family members met with the research team to begin developing the specific interventions. An initial 3-day session was held for which the non-university participants received a monetary stipend. The goal of these initial discussions was to begin the development of teacher-friendly manuals, based on the empirical literature, dubbed Effective Strategies Manuals (ESM), to assist the teachers in implementing these strategies in their classrooms.

The researchers began the discussions by presenting information about what constitutes evidence. The concepts of effect size (ES) and meta-analysis were explained and a consensus was reached that the ES of possible strategies should be considered before including them in the manuals. After examining the literature reviewed in the grant proposal and taking into account the input of the families and school-based partners, action plans for each of the four manuals (i.e., reading instruction, formative evaluation, PBSs, and family involvement) were developed at the conclusion of the 3-day work session. The following sections summarize the empirical literature that was reviewed and served as a stimulus for the discussion that occurred for each of the target areas.

2.3.1. Enhanced reading comprehension

Improvement in reading can be achieved by teaching specific skills to students through specific techniques. The most effective of these techniques includes employing mnemonic strategies (Mastropieri & Scruggs, 1989), direct instruction (White, 1988), and structured reading strategies

(Gersten, Carnine, & Woodward, 1987). These interventions have an ES ranging from .84 to 1.25 (Kavale & Forness, 2000), indicating sizable empirical effects as well as educational importance.

After reviewing the literature, the teachers pointed out that the school district had offered training to all the teachers in a reading program titled “Creating Independence Through Student-owned Strategies” (CRISS) (Santa, Havens, & Maycumber, 1996). Upon examination, many of the effective practices noted in the literature were contained in the CRISS program. Direct instruction techniques and structured reading strategies such as graphic organizers, activating background knowledge, and finding main ideas were the core of the program and teachers agreed that these instructional techniques were effective practices. The teachers also noted that there were numerous effective strategies in the CRISS program but the size and format of the manual did not facilitate use of the program. A consensus was quickly reached that in order to improve reading comprehension, the group would focus on adapting the CRISS program to the specific needs of the special education teachers. Thus, the manual provided suggestions for incorporating CRISS recommended strategies such as Think-Pair-Share, Selective Highlighting and Underlining, and Marginal Note Taking into all content area classes.

2.3.2. *Formative evaluation*

Typically, teachers use final grades to indicate how a student has performed in a particular course, i.e., a summative evaluation. When teachers give frequent feedback to students indicating how much they are improving, how well they are accomplishing the objectives of the course, and how well they are mastering intermediate objectives, this is considered to be formative evaluation. There is clear evidence that using formative evaluations in the classroom leads to increased academic performance by students (Fuchs & Fuchs, 1986). In their meta-analysis of over 100 studies, Fuchs and Fuchs (1986) found ESs ranging from .70 to 1.25. Because the term formative evaluation was considered technical jargon by the teachers and administrators, we began to use “providing academic feed-back” instead of “formative evaluation”. Teachers identified various methods for providing academic feedback to students such as using graphs and charts to help students track their progress in academic classes. The manual included model graphs and charts

based upon grade level expectations that teachers and students could customize for use in their classes.

2.3.3. *PBS*

PBS has been influenced by applied behavior analysis and has evolved into a procedure that is effective, non-aversive, and socially valid for resolving serious problem behaviors (Carr et al., 2002; Horner et al., 1990). It is a technique that reduces problem behaviors while building useful and desirable skills. Considerable research has demonstrated that PBS is clearly an effective strategy in addressing challenging behaviors in individuals who have developmental disabilities (Carr et al., 1999; Marquis et al., 2000), and it is expanding rapidly to other populations (Lane, Umbreit, & Beebe-Frankenberger, 1999). PBS operates on the assumption that behavior is functional and is influenced by the ecological context in which it occurs. Therefore, changing or altering environments provides the potential to decrease problem behaviors and enhance quality of life (Carr et al., 2002; Koegel, Koegel, & Dunlap, 1996). Research syntheses of PBS report several meta-analyses with ESs above 1.0 and interventions implemented at the individual, the classroom, and the school-wide levels (Marquis et al., 2000).

PBS is very compatible with the new paradigms of disability. It emphasizes strengths of individuals, uses instructional methods to develop accommodations to the environment, and empowers individuals through skill development. Because of the instructional foundation of PBS, this approach resonates with teachers and moves them from “deficit thinking” to a promotion of wellness and competency. The participating teachers and administrators were all familiar with PBS and knowledgeable about its fundamental concepts.

The PBS manual provides strategies, such as effective arrangement of desks and learning materials, to help teachers create a more proactive atmosphere in their classrooms. The manual also addresses such issues as transitioning between activities and classes and the creation of appropriate classroom rules to promote success.

2.3.4. *Parent involvement*

Most of the major initiatives on school reform, such as the *No Child Left Behind Act* and the President’s Commission on Excellence in Special Education, call for strengthening the partnership between parents and educators in order to improve

the performance of children. While the database examining parent involvement is not yet large enough to support extensive meta-analyses, there is at least one research synthesis (Cotton, 1995) and several reviews (e.g., Downey, 2002; Duchnowski, Dunlap, Adiegbola, & Berg, 1995; Turnbull & Turnbull, 1997) that indicate the positive effects on student performance attributed to parent involvement.

While the researchers on the project pointed out the lack of strong evidence for the effectiveness of family involvement, the other members of the partnership (teachers, administrators, and family members) expressed the view that this was an important factor to consider for inclusion in the project and the existing data should be considered to be “clinically” supportive if not statistically supportive. Furthermore, all schools in the state were required to have the goal of improved family involvement in their annual *School Improvement Plan*. The discussion around family involvement is an example of adopting a multi-paradigmatic approach. Diverse perspectives about the nature of data and approaches to determining evidence were explored. With discussion, a consensus about the usefulness of the construct of family involvement was reached and it was included in the project.

Teachers indicated that family involvement was an area that was difficult to handle successfully. The manual provides suggestions for encouraging families to be involved in traditional ways such as through Parent/Teacher organizations or by volunteering in the classroom, or in non-traditional ways, such as working from home. Checklists to solicit information about families’ interests and abilities

were included to help teachers make contact and develop relationships with the families. The manual also includes sample letters for teachers to use at the beginning of the school year to inform families about class expectations and provide contact information.

2.4. Phase two: producing the manuals

Based on the group discussions that took place during the work sessions, drafts of the manuals were produced and included specific instructional strategies. The draft manuals were designed to include: (1) Reading Strategies for Special Populations, (2) Providing Academic Feedback for Special Populations, (3) PBSs and (4) Increasing Family Involvement for Special Populations. In addition to the information provided by the teachers, staff, and parents from the schools, materials from other sources were used as well (Bigge & Stump, 1999; Santa, Havens, & Maycumber, 1996; University of California at Los Angeles, School Mental Health Project, n.d.). The manuals included: (1) research-based information on the topic, written in a user-friendly manner, (2) teacher’s suggestions about effective strategies and how to implement them efficiently, (3) suggestions for getting started at the beginning of the school year, and (4) reproducible charts and graphs to help teachers plan and track students’ progress.

Several months after the summer meeting (Month 4 of the project), Draft 1 of the manuals were given to special education teachers from each of the participating schools who had not been able to attend the work sessions but who agreed to read Draft 1 of the manuals. Table 1 contains a timeline

Table 1
The activities and outcomes across time to develop the Effective Strategies Guides

Project month	Activity	Outcome
0	Met with school staff and parents to get support for project	Submitted successful grant application
1	Conducted 3-day work session	Framework for manuals developed
4	Produced Draft 1 of manuals. Distributed to teachers not involved in work session	Collected feedback and revised manuals
6	Produced and distributed Draft 2 of manuals to all special education teachers	Planned work session
8	Conducted work groups	Developed lesson plans to be included in manuals and collected feedback and revised Draft 2
12	Produced and distributed Draft 3	Collected feedback and revised manuals
14	Met with teachers and collected feedback on Draft 3	Revised manuals
16	Distributed Draft 4	Implementation of ESMs began

of the sequence of activities to develop and implement the ESM.

Individual meetings were scheduled between the readers and the project coordinator to discuss readers' reactions to the information and implementation strategies. These suggestions were incorporated into the next draft version. Draft 2 of the manuals were distributed to all special education teachers at the target schools at the beginning of the second semester, and, after they had time to read and implement some of the strategies, a 1 day work session was held.

At this session, the special education teachers and parents met with the study staff to build specific lesson plans and instructional supports that could be incorporated into the ESM and readily used in the classroom. Three groups of teachers presented lesson plans incorporating strategies from the Reading and Providing Academic Feedback manuals to the group for consideration for inclusion into the manuals. Two groups of teachers using strategies from the Parent involvement manual developed action steps with examples of forms that could be implemented in their classrooms to increase parent involvement. A separate meeting was held with all teachers participating in a discussion of and feedback for the PBS manual. The study staff collected the comments and material developed by the teachers in the work session and the PBS meeting in order to incorporate it into a revision of the manuals.

2.5. Phase three: beginning the intervention

At the start of the second year of the project (end of month 12) the study staff met with teachers and administrators from the target schools to distribute Draft 3 of the ESMs. Each teacher also received a rubric, for each of the four areas, summarizing the suggested strategies identified in the manuals in order to facilitate implementation. For example, for Parent involvement the rubric contained items such as: send a welcoming letter to parents at the start of school; send letter to parents of new students during the year; send parent friendly materials home to help with assignments. This meeting was videotaped to enable the staff to include newly hired teachers who were unable to attend the planning meetings but wanted to participate in the project. The project coordinator subsequently met with these teachers individually to orient them to the procedures.

After 2 months of implementation (month 14), study staff met with teachers and administrators at the target schools to review Draft 3 of the manuals and discuss feedback and suggestions for edits. Study staff collected the feedback and revised the manuals. Two months later (month 16) teachers were given Draft 4 of the manuals and formal implementation began.

2.6. Phase four: monitoring implementation

Historically, the traditional approach to knowledge transfer and the training of professionals was to “cast information unto the masses and learning will occur” (Louis, 1995, p. 287). It was commonly believed that once new skills or behaviors were delivered during a training session, usually through a lecture, the adoption of these new behaviors was assured. Additionally, as Malouf and Schiller (1995) point out, “when research does find it ways into practice, it is often misapplied” (p. 419). Recent problems making direct connections and causative statements between training efforts of teachers and improved outcomes with students has heightened the need to examine the degree to which the training content was implemented as intended. This heightened awareness has led to efforts to measure the degree to which critical elements of training programs have been implemented and how this level of implementation affects outcomes (Bond et al., 2000).

2.6.1. Procedure to measure implementation

An assessment system to measure implementation of the ESMs was modeled after the Intervention Validity Checklist (IVC) system by Vaughn and her colleagues (1998). The IVC's were developed to measure the extent to which teachers implemented components of instructional practices presented in a professional development program and provide a practical guide to measuring implementation. The first step was to isolate the behaviors thought to be essential to the topic. Project staff reviewed each manual and isolated the behaviors described in each manual that were thought to be the most critical to successful implementation. These behaviors were then used to build a fidelity scale for each manual. This scale contained a description of the evidence that needed to be provided in order to ascertain if a teacher had used a behavior in the manual. Specifically, the scale recorded the presence of the behavior by the teacher and the number of students

affected. The scale also contained instructions as to how to evaluate the evidence provided by the teacher. The fidelity assessment scale for each topic contained ten items, with each item rated either 0 = not implemented or 1 = implemented. Therefore, each manual's fidelity assessment could range from a score of 0 (no strategies were used) to 10 points (all strategies were used with 1 point given for each of the ten areas).

To assist in the interpretation of the assessment of fidelity on implementation, teachers from comparison schools were also assessed with the fidelity instrument. That is, we measured the degree to which they implemented strategies in the ESMs, without any training, compared to teachers in the project schools. These data would supply an evaluation of the value of the training program.

2.6.2. Validity

To establish if domains in the fidelity assessment captured the core elements of the training information adequately, an outside content expert in the area of the training manual was asked to assist (Bond et al., 2000). The content expert in each of the areas covered by the manuals was asked to review the fidelity assessment. Each expert was asked to comment on the adequacy of the fidelity assessment (i.e., did it cover the topic adequately), the adequacy of the items to capture the individual domains, and if any area was not captured in assessment. Each content expert reviewed the materials and found no deficiencies in the assessments. Using outside experts in this way helps to support the overall validity of the initial stages of the fidelity assessments.

2.6.3. Reliability

To test the feasibility and reliability of the fidelity assessments, a pilot investigation was conducted with four teachers independent of the project. Four project staff participated in each teacher interview with one staff member conducting the interview and all study staff rating the teacher's responses. The interclass correlation coefficients (ICC) from this pilot effort revealed that all the reliability coefficients were above .75 and therefore could be classified as "excellent" (Fleiss, 1986). During the administration of the fidelity assessments with project teachers, two staff members rated six teachers in order to assess reliability. Again, of the six ICC's calculated across all areas, five were above .75 and could be classified as "excellent" while one

value (.68) could be classified as "fair to good". These data support the reliability of the four fidelity scales.

3. Results

The results of the assessment of implementation of the instructional strategies with project teachers revealed wide variation between the strategies. The area with the highest degree of implementation was PBS with an average of 76% of these strategies being implemented by project teachers. Parent involvement had the next highest level of implementation with 67% of these strategies implemented by project teachers. The implementation level for formative evaluation was 62% and the lowest level of implementation was Reading with an average implementation level of 51%.

To put these results into perspective, teachers at comparison schools who had not been involved in the project were assessed as to the degree they implemented the strategies discussed in the project manuals. The results from the teachers at the comparison schools provided a general indication of the level of implementation of the strategies when training and support were not provided. In almost all cases, the project teachers were implementing more of the strategies than the comparison teachers suggesting that the project teachers were using more evidence-based practices than "typical teachers" in the district, see Table 2. The only exception was in the area of reading at the middle school level where

Table 2

Average level of implementation by middle and high school teachers by area assessed

Area assessed		Middle school teachers (%) ^a	High school teachers (%) ^b	All teachers (%)
PBS	Project	83	62	76
	Comp	30	42	37
Reading	Project	51	55	53
	Comp	58	30	44
Parent involvement	Project	66	70	67
	Comp	50	43	47
Formative evaluation	Project	64	58	62
	Comp	53	43	48

^aMiddle school teachers: $n = 10$ project teachers; $n = 5$ for comparison teachers.

^bHigh school teachers: $n = 5$ project teachers; $n = 5$ comparison teachers.

the comparison and project teachers were similar in their levels of implementation. It should be noted that the comparison teachers in this investigation spent their day teaching reading to special education students. Therefore, it appears that project teachers who taught a range of subjects were integrating the same level of reading skills into their instruction as specialized reading teachers were at the comparison school. Overall, these data support the notion that project teachers were implementing a majority of the instructional strategies featured in the manuals.

3.1. Implications and future research

The initial results of this project are encouraging and supportive of continued efforts in this direction. A partnership of researchers, teachers, administrators, and family members was formed and reached consensus about developing strategies intended to improve outcomes for students who have disabilities. The work of the partnership led to a successful grant application to support planned activities that are continuing. This article has presented a description of the process developed to achieve the collaborative partnership, the production of a manualized set of evidence-based strategies to be implemented by special education teachers, and the results of evaluating the implementation of the strategies.

3.1.1. Forming partnerships

The literature contains several articles identifying barriers to the implementation of evidence-based practices by teachers (Greenwood & Abbott, 2001). One of the primary barriers identified is the observation that teachers often disagree with researchers about what constitutes effective practice. Teachers often view the work of researchers as too theoretical and removed from the classroom. Consequently, they do not develop ownership of strategies that are recommended by researchers and implementation is not at a sufficient level to achieve positive impact. In this project, time was spent at the onset to engage teachers and school administrators by soliciting their input and carefully presenting relevant research literature for their consideration. The result was the development of an action plan that had consensus from all the stakeholders and agreement on what constitutes evidence-based practices. The cost for this outcome was an investment of time by the researchers at the beginning of the grant cycle to engage teachers in a

process that was clearly different from the expert model (one-session professional development experience) that is standard practice. Teachers, administrators, and parents also invested time which was not part of their assigned work and for which they were compensated at a token or symbolic level. There are other ways to engage public school staff in such activities without the external support of a grant. For example, school districts encourage school improvement activities and sometimes require continuing education credit, both of which could be used to support teacher involvement with researchers for an extended period of time.

3.1.2. Collaborative production of manuals

In this project, there was an extensive effort to solicit critiques by the teachers for the ESM. This procedure allowed teachers to see the manuals change as a result of their input, adding to the degree of ownership they developed for the project. In addition, teachers suggested changes that resulted from their experience and sometimes appeared to be in conflict with the research. For example, much of the work in the area of formative evaluation has been done at the elementary level. Posting wall charts of student progress is a common activity and elementary age students appear to react positively to this strategy. Our teachers were from a middle school and a high school and reported that their students would not take part in public charting of their progress and this strategy was dropped from the manual. The shared decision-making process may require more time but it may have important effects on the quality of outcomes.

3.1.3. Implementation fidelity

In this project we have demonstrated a relatively cost-efficient method to evaluate the degree to which intended interventions are actually being implemented in the classroom. Our fidelity procedures had high inter-rater reliability and there was expert validation of the content in the fidelity measure for the target areas. Overall, teachers used approximately 62% of the strategies contained in the ESMs. There was, however, variability between teachers and across the four target areas. The relatively low degree of fidelity for the reading strategies (44%) was surprising in light of the high degree of adherence in other targets such as PBS (72%). The findings were shared with the research partners and refinement of the manuals continues.

3.1.4. Next steps

The ultimate test of the effectiveness of evidence-based practices and their impact will be the evaluation of their effect on the academic achievement of the students and their behavioral functioning. Researchers who examine curriculum development and instructional techniques are faced with two challenges. First, they must develop methods to evaluate the degree to which innovative techniques are implemented in typical classroom settings (fidelity). Second, they are challenged to evaluate the impact of these innovations on the premier outcomes of education: academic achievement in basic skills. In this study, we have demonstrated the feasibility of a participatory approach to the implementation of evidence-based instructional strategies in special education classrooms. A logical next step would be to conduct a rigorous controlled study in which schools would be randomly assigned to an intervention or standard practice condition in order to evaluate the effectiveness of the ESMs in improving educational outcomes for children. This type of applied research will contribute to the facilitation of increased implementation of evidence-based practice and improvement in the outcomes for students who have disabilities.

Acknowledgement

Preparation of this article was supported, in part, by the Office of Special Education Programs Grant Number H324T00019.

References

- Bond, G. R., Williams, J., Evans, L. J., Salyers, M., Sharpe, H., Kim, H. W., et al. (2000). *Psychiatric rehabilitation fidelity toolkit*. Cambridge, MA: Human Services Research Institute.
- Bigge, J. L., & Stump, C. S. (1999). *Curriculum, assessment, and instruction for students with disabilities*. Belmont, CA: Wadsworth.
- Carr, E. G., Dunlap, G., Horner, R. H., Koegel, R. L., Turnbull, A. P., Sailor, W., et al. (2002). Positive behavior support: Evolution of an applied science. *Journal of Positive Behavior Interventions*, 4(1), 4–16–20.
- Carr, E. G., Horner, R. H., Turnbull, A. P., Marquis, J. G., McLaughlin, D. M., & McAtee, et al. (Eds.). (1999). *Positive behavioral support for people with developmental disabilities: A research synthesis*. Washington, DC: American Association on Mental Retardation.
- Cook, B. G., & Schirmer, B. R. (2003). What is special about special education? Introduction to the special series. *The Journal of Special Education*, 37, 139.
- Cotton, K. (1995). *Effective schooling practices: A research synthesis 1995 update*. Portland, OR: Northwest Regional Educational Laboratory.
- Downey, D. B. (2002). Parental and family involvement in education. In *School reform proposals: The research evidence*. Retrieved from <http://www.asu.edu/educ/eps/EPRU/documents/EPRU%202002-101/Chapter%2006-Downey-Final.rtf>
- Duchnowski, A., Dunlap, G., Adiegbola, M., & Berg, K. (1995). Rethinking the participation of families in the education of children: Clinical and policy issues. *Integrating school restructuring and special education reform*. Orlando, FL: Harcourt Brace.
- Fleiss, J. L. (1986). *The design and analysis of clinical experiments*. New York: Wiley.
- Forness, S. R., Kavale, K. A., Blum, I. M., & Lloyd, J. W. (1997). Mega-analysis of meta-analyses. *Teaching Exceptional Children*, 29, 4–7.
- Fuchs, D., & Fuchs, L. A. (2001). One blueprint for bridging the gap: Project PROMISE: (Practitioners and Researchers Orchestrating Model Innovations to Strengthen Education). *Teacher Education and Special Education*, 24(4), 304–314.
- Fuchs, L. A., & Fuchs, D. (1986). Effects of systematic formative evaluation: A meta-analysis. *Exceptional Children*, 53, 199–208.
- Gersten, R., & Bregelman, S. U. (1996). The quest to translate research into classroom practice: The emerging knowledge base. *Remedial and Special Education*, 17(2), 67–74.
- Gersten, R., Carnine, D., & Woodward, J. (1987). Direct instruction research: The third decade. *Remedial and Special Education*, 8, 48–56.
- Gersten, R., Schiller, E. P., & Vaughn, S. (2000). *Contemporary special education research: Synthesis of the knowledge base on critical instructional issues*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Greenwood, C. R. (2001). Bridging the gap between research and practice in special education: Issues and implications for teacher preparation. *Teacher Education and Special Education*, 24(4), 273–275.
- Greenwood, C. R., & Abbott, M. (2001). The research to practice gap in special education. *Teacher Education and Special Education*, 24(4), 276–289.
- Greenwood, C. R., & Maheady, L. (2001). Are future teachers aware of the gap between research and practice and what should they know? *Teacher Education and Special Education*, 24(4), 333–347.
- Horner, R. H., Dunlap, G., Koegel, R. L., Carr, E. G., Sailor, W., Anderson, J., et al. (1990). Toward a technology of “nonaversive” behavioral support. *Journal of Association for Persons with Severe Handicaps*, 15, 125–132.
- Kavale, K. A., & Forness, S. R. (2000). Policy decisions in special education: The role of meta-analysis. In R. Gersten, E. P. Schiller, & S. Vaughn (Eds.), *Contemporary special education research: Syntheses of the knowledge base on critical instructional issues* (pp. 281–326). Mahwah, NJ: Lawrence Erlbaum Associates.
- Koegel, L. K., Koegel, R. L., & Dunlap, G. (Eds.). (1996). *Positive behavioral support: Including people with difficult behavior in the community*. Baltimore: Paul H. Brookes.
- Kromery, J. D., Hines, C. V., Paul, J., & Rosselli, H. (1996). Creating and using a multiparadigmatic knowledge base for restructuring teacher education in special education:

- Technical and philosophical issues. *Teacher Education and Special Education*, 19(2), 87–101.
- Landrum, T. J., Tankersley, M., & Kauffman, J. M. (2003). What is special about special education for students with emotional or behavioral disorders? *The Journal of Special Education*, 37, 148–156.
- Lane, K. L., Umbreit, J., & Beebe-Frankenberger, M. E. (1999). Functional assessment research on students with or at risk for EBD. *Journal of Positive Behavior Interventions*, 1, 101–109.
- Louis, K. S. (1995). Improving urban and disadvantaged schools: Disseminating and utilization perspectives. *Knowledge and Policy: The International Journal of Knowledge Transfer and Utilization*, 13, 287–304.
- Marquis, J. G., Horner, R. H., Carr, E. G., Turnbull, A. P., Thompson, M., Gehrens, G. A., et al. (2000). A meta-analysis of positive behavior support. In R. Gersten, E. P. Schiller, & S. Vaughn (Eds.), *Contemporary special education research: Synthesis of the knowledge base on critical instruction issues* (pp. 137–178). Mahwah, NJ: Lawrence Erlbaum Associates.
- Mastropieri, M. A., & Scruggs, T. E. (1989). Constructing more meaningful relationships: Mnemonic instruction for special populations. *Educational Psychology Review*, 1, 83–111.
- Malouf, D., & Schiller, E. P. (1995). Practice and research in special education. *Exceptional Children*, 61, 414–424.
- President's Commission on Excellence in Special Education. (2002). *A new era: Revitalizing special education for children and their families*. Washington, DC: Author.
- Paul, J., Duchnowski, A. J., & Danforth, S. (1993). Changing the way we do business. One department's story of collaboration with public schools. *Teacher Education and Special Education*, 16, 95–109.
- Paul, J., Epanchin, B., Rosselli, H., & Duchnowski, A. (1996). The transformation of teacher education and special education: Work in progress. *Remedial and Special Education*, 17(5), 310–322.
- Santa, C. M., Havens, L. T., & Maycumber, E. M. (1996). *Project CRISS: Creating independence through student-owned strategies*. Dubuque, IA: Kendall/Hunt.
- Slavin, R. E. (2002). Evidence-based education policies: Transforming educational practice and research. *Educational Researcher*, 31(7), 15–21.
- Turnbull, A. P., & Turnbull, H. R. (1997). *Families, professionals, and exceptionality: A special partnership* (3rd ed). Upper Saddle River, NJ: Merrill/Prentice-Hall.
- University of California at Los Angeles, School Mental Health Project, n.d. Retrieved from <<http://smhp.psych.ucla.edu/describ.htm>>.
- Vaughn, S., Hughes, M. T., Schumm, J. S., & Klingner, J. (1998). A collaborative effort to enhance reading and writing instruction in inclusion classrooms. *Learning Disability Quarterly*, 21, 57–74.
- White, W. A. T. (1988). A meta-analysis of effects of direct instruction in special education. *Education and Treatment of Children*, 11, 364–374.