Professional Development in TBI for Educators: The Importance of Context

Ann Glang, PhD; Bonnie Todis, PhD; Patricia Sublette, PhD; Brenda Eagan Brown, MSED; Monica Vaccaro, MS

Effective instructional and behavioral support strategies implemented by trained educators can help mitigate the academic and behavioral challenges associated with childhood brain injury. However, the training provided by university teacher preparation programs is clearly inadequate, a problem that cuts across the professions that work with school-aged students. Educators need training in methods validated for students with traumatic brain injury (TBI) and in adapting strategies validated for students with other disabilities. Almost 10 years after Ylvisaker and colleagues proposed a research and professional development agenda in the area of teacher training, students with TBI continue to be underserved and underidentified for educational supports. Effective staff development practices for educators must include training in evidence-based interventions, supervised practice with new skills, and continued mentoring, feedback, and consultation in the school setting. Two models currently in use—the TBI Consulting Team and BrainSTARS models—incorporate those features. Preliminary evidence suggests that these models help teachers feel more prepared and knowledgeable in working with students with TBI. Given the urgent needs of students with TBI, validating these promising practices should be a high priority for the field of pediatric brain injury.

Keywords: brain injuries, education, in-service training, pediatrics, schools, staff development, students, teaching
TBI a “low-incidence disability,” in part because a relatively small number of students has been identified for special education under the eligibility of TBI, which in turn contributes to the chronic problem of insufficient teacher preparation.\textsuperscript{17} Given the general lack of awareness of TBI that currently characterizes the field, effective in-service and preservice training models must be identified and implemented. Fortunately, a substantial body of research on teacher training practices can be used to design effective training in supporting students with TBI. This article describes current professional development efforts that incorporate features of evidence-based training to improve academic outcomes for students with TBI.

**PROFESSIONAL DEVELOPMENT IN EDUCATION**

Because of an increased focus on teacher accountability for student performance in today’s schools,\textsuperscript{20} professional development for educators now emphasizes evidence-based practices—that is, both the training content and the training methods must have demonstrated effectiveness in improving student outcomes. Traditionally, professional development in education has relied on an outside expert who delivers information in a lecture format to teachers away from their classrooms. Attendees are then expected to transfer the knowledge presented to their classrooms.\textsuperscript{21} Unfortunately, this type of in-service without follow-up is rarely effective in helping educators actually implement the skills and knowledge gained in training.\textsuperscript{22–26} According to Fullan, even sessions that “meet the highest standard of adult learning... can never be powerful enough, specific enough, or sustained enough to alter the culture of the classroom or school if they are delivered out of context with no follow-up.”\textsuperscript{27(p35)}

**Evidence-based components of professional development**

The past 30 years of research on professional development points to a number of critical components for effectiveness (regardless of the particular subject or method being taught): require teachers to practice their new skills in the school environment,\textsuperscript{28–32} provide access to sufficient organizational supports,\textsuperscript{22} use evidence-based strategies linked to the instructional content,\textsuperscript{33,34} and provide consultation on the implementation of new skills in the instructional setting (eg, Bowen,\textsuperscript{35} Fuchs & Fuchs,\textsuperscript{36} Gersten et al,\textsuperscript{37} Sailor & Price\textsuperscript{38}). In regard to the latter, direct training with modeling, rehearsal, and feedback provides opportunity for practice (across several weeks or months) and increases the likelihood of generalization.\textsuperscript{39} Indirect training involving didactic or written presentation of material and verbal discussion about new strategies is less likely to transfer to classroom practice.\textsuperscript{40–42} Teachers need hands-on practice with new skills and strategies in the instructional context to effectively integrate those skills into their teaching repertoire.\textsuperscript{40} Finally, consultation must be of sufficient duration (eg, 7–8 sessions) to produce long-term sustained use of new strategies in the instructional setting.\textsuperscript{32–45,44}

Of all these components, provision of consultation in the natural setting is both the most challenging to deliver and the most important in terms of changing teacher practices.\textsuperscript{17,18,20,45} Joyce and Showers\textsuperscript{46} found that a traditional, didactic approach to educator training led to a 10% increase of general knowledge among attendees, a 5% change in the skill levels of teachers, and no change in the use of those skills in the classroom. When demonstration and practice were added to the training, knowledge gains increased to 60%, and 60% of attendees were able to demonstrate the newly learned skill. Still, only 5% of those trained actually used the new skills in the classroom. Only when on-site coaching was added to the training was there significant transfer to educational practice. When the expert came to the trainees’ classrooms, modeled the new skill with students, and offered feedback on trainee implementation of the skill, 95% of trainees demonstrated an increase in knowledge and in the use of that skill in the classroom.\textsuperscript{46}

**Professional learning communities**

School systems increasingly recognize that developing, implementing, and maintaining new skills over time and across settings requires ongoing professional development support in context.\textsuperscript{30} This recognition has resulted in widespread implementation of professional learning communities (PLCs) in both general and special education settings.\textsuperscript{32,47} Professional learning communities incorporate important features of effective professional development: practicing new skills in real-life contexts, consultation with other practitioners, and corrective feedback in the classroom setting.\textsuperscript{48} In some PLCs, teachers interact with university personnel or others with expertise in the target skill. Ongoing readings and discussion are used to improve understanding of educators’ learning and teaching. Professional learning communities offer a structure within the school for the provision of situation-specific support to ensure that newly learned skills successfully transfer to the instructional setting.\textsuperscript{31,49}

**PROFESSIONAL DEVELOPMENT IN TBI**

Two promising models that incorporate features of effective professional development practices are currently in use among educators serving students with TBI: the TBI Consulting Team model\textsuperscript{50} and BrainSTARS

www.headtraumarehab.com
TBI consulting team model

The TBI Consulting Team model was developed in the early 1990s following the addition of TBI as a special education category under the Individual with Disabilities Education Act in 1991. The goal of the model is to make a group of trained, multidisciplinary, school-based consultants available to schools statewide to provide in-service training and ongoing consultation to educators of children with TBI. Although details of the model vary from state to state, the team model features these core components: (1) recruitment of educators who are interested in improving services to students with TBI in their local school districts; (2) ongoing, evidence-based training; (3) mentorship and ongoing coaching to ensure fidelity of implementation of trained skills; and (4) development of a TBI-specific PLC.

Typically, the TBI Consulting Team model uses a multiphase training approach. Initial training provides information about the incidence and effects of TBI, and strategies for working effectively with students, families, and teachers. The training usually occurs over an extended period (6–12 months), includes approximately 40 hours of training, and is based on the literature on childhood TBI. In areas where research on interventions for TBI is lacking, the training includes strategies that have been validated with youth with other disabilities who have learning and behavioral challenges similar to youth with TBI. Training approaches include modeling, practice with feedback, and assignments between sessions that provide real-world practice opportunities. Team members are peer-mentored by an experienced TBI consultant as they conduct in-service training in classroom settings and consult with peers in their local school districts. A TBI consultant is typically asked by a school team to help identify effective methods to improve student outcomes. The number of consultant visits and length of the consultation period varies according to need, but typically occurs over several months.

Ongoing support to team members includes regular trainings on current research and technical assistance. In each state, the TBI Consulting Team model provides the opportunity for team members to function as a PLC as they continue to learn new information and strategies to support students with TBI. In some states, a centralized resource person coordinates administrative functions, including providing materials and training, publicizing team services, maintaining a Web site, and providing data collection and evaluation services.

Originally established in Iowa, the model was subsequently adopted in Kansas, Oregon, Arizona, Colorado, Pennsylvania, Tennessee, and Hawaii. Two states implementing the team model, Oregon and Pennsylvania, collect annual data on its impact. Operational since 1994 and supported initially with federal funding (US Department of Education, Office of Special Education Programs; Health Resources Service Administration, Maternal and Child Health Bureau), the Oregon TBI team has been sustained with state education funds since 1998. The Pennsylvania model, named BrainSTEPS (strategies teaching educators, parents & students), has been implemented through the Brain Injury Association of Pennsylvania since 2007 and is funded through a federal Title V Maternal & Child Health Block Grant from the Pennsylvania Department of Health in partnership with the Department of Education. Although there is some variability across the 2 states, the models are quite similar, with the only divergence being specific training content (see Supplemental Digital Content Table 1 at http://links.lww.com/JHTR/A46), the number of hours of initial training (approximately 40 in Oregon and 20 in Pennsylvania), and the frequency of PLC gatherings (monthly in Pennsylvania, quarterly in Oregon).

Evidence of impact in Oregon

Program evaluation data on the impact of the initial implementation of the Oregon Team model suggested that immediately following the final workshop in the year-long training period, team members (N = 51) reported feeling more competent to meet the needs of students with TBI across 4 areas (physical, social/behavioral, cognitive, and academic). Team members also rated highly the entire team’s effectiveness, indicating confidence that their services would be helpful to school personnel. Furthermore, participants at trainings conducted by team members rated the trainings as effective or very effective.

Recent data about the ongoing effects of the team model suggest that this approach continues to benefit Oregon students and educators. Data are collected using activity logs that team members submit quarterly. During the 2008–2009 school year, Oregon TBI team members provided services for 156 students. Approximately 72% of activities involved the provision of training and consultation to educators in the school setting (including problem-solving about specific cases, onsite coaching in implementing new strategies, and identifying resources for students and families). In addition, 21% of team member activities involved attending school meetings for students with TBI. Over the course of the year, team members provided 20 presentations on TBI for over 700 school staff, including specific student-centered trainings and awareness-building presentations for regional groups of educators.
Evidence of impact in Pennsylvania

Although the specific measures and timing of data collection activities vary from Oregon, program evaluation data gathered in Pennsylvania also include information about knowledge and perceived competence of team members and the nature of consulting activities performed by team members. Following approximately 30 hours of training over a 5-month period, 67 of the 75 team members who attended the final training (89%) rated their knowledge and competence on a scale of 1 (strongly disagree) to 4 (strongly agree) on 3 items. They rated themselves as more knowledgeable (mean = 3.48), better prepared (mean = 3.52), and better able to provide information about brain injury to others (mean = 3.57). During a 1-year period (February 2009 to January 2010), team members provided services to 154 students. Team members spent an average of 6 hours per student, providing consultation and training for students, families, and educators. Most activities involved consultation (55%) (ie, sharing information; monitoring student progress; modifying the curriculum, environment, or instructional methods; identifying behavioral or cognitive compensatory strategies; and identifying effective assistive technology tools). Other frequent activities were communication with the family (21% of activities) and information sharing among the team (10%).

During the same period, team members conducted 70 TBI in-service workshops and individualized trainings for 2347 professionals.

In summary, both initial and recent program evaluation data on the team model as implemented in Oregon and Pennsylvania suggest that following training, team members feel more prepared and knowledgeable in working with students with TBI, and that team members are actively engaged in providing training and consultation for their colleagues who work directly with students with TBI. Preliminary data from Oregon show that this peer-to-peer training has been rated as helpful by recipients. A key weakness of the evaluation data is the lack of any data on the actual impact of the model on student functioning. As noted in the earlier report on the Oregon team model and in later work by Ylvisaker and colleagues, the next step is to systematically investigate the impact of the model on students, families, and educators.

BrainSTARS

BrainSTARS is a manual-based intervention designed to educate parents and school personnel about the link between observed behavioral deficits and the underlying neurodevelopmental weaknesses. The manual also provides strategies for intervention and accommodation to remediate the underlying weaknesses and improve the fit between environmental expectations and student capabilities. The program may be implemented either as a stand-alone resource or as the primary curriculum for a consultation model. BrainSTARS has been widely implemented in the Rocky Mountain Region and the manual has been distributed statewide in several states (eg, Hawaii, Washington).

In the consultation model, the consultant meets 3 times with the parent-school team, with intervals of 6 to 8 weeks between sessions. At the first meeting, the consultant helps the team assess the student’s behavior in each of the 20 neurodevelopmental clusters. These clusters were derived from a review by the BrainSTARS developers of 50 neuropsychological evaluations of children with acquired brain injury (10 from each of 5 developmental phases). The parent-school team then prioritizes up to 5 clusters on which to focus. Using relevant sections of the manual, the team develops a working plan of accommodations and interventions to address each deficit area. In the second and third sessions, the team discusses the student’s progress and reviews and amends the working plan as needed.

Evidence of impact of BrainSTARS

Preliminary evidence of impact was provided in a pilot study conducted by the developers of the program. BrainSTARS was implemented with 30 parent-school personnel teams using the procedures described above. Participants completed pre and post measures of parent/teacher proficiency and ratings of the target student in each of the 20 neurodevelopmental abilities addressed by BrainSTARS. Both parents and teachers also completed the Behavior Rating Inventory of Executive Functions (BRIEF) and the Behavior Assessment System for Children (BASC). Following completion of the preintervention measures, parent/school personnel teams met 3 times (as described above) in individual sessions with a BrainSTARS consultant. At least 1 teacher and often 5 or 6 school personnel were present for the entire consultation.

The program developers reported that after the 3 meetings considerable improvements were found in participants’ self-rated proficiency in working with children with acquired brain injury and their ratings of student performance in targeted neurodevelopmental areas. At a 3-month follow-up, the pilot study found that both parents and teachers reported that the program contributed to “significantly improved” student behavior, social adjustment, and learning. However, no significant changes were found in ratings on standardized measures of child executive functions or behavior.

The authors speculated that the absence of changes on the standardized measures might be because the measures were not tied directly to the BrainSTARS program and both the BASC and the BRIEF are designed to yield...
stable scores over time. The authors also pointed out that a ceiling effect may have played a role; parents’ preintervention ratings were in the average range and teacher ratings were barely elevated above average, restricting the impact of the intervention on the small pilot sample. Both parents and teachers reported that the manual and consultation program improved morale, optimism, and working relationship.

The authors noted several limitations of the pilot study, including its quasi-experimental, pretest-posttest design and its reliance on parent and teacher self-report of changes in student behavior. They acknowledged that reported improvements might be attributable to response bias, but offered 2 arguments against this conclusion: the changes were not uniformly positive, and the largest changes were in areas targeted by the BrainSTARS program, not in areas “that would ultimately be more pleasing to either the participants or researchers”92(p178) (such as behaviors assessed on the BRIEF and the BASC). The developers concluded that further investigation is warranted to rule out response bias and to test the effectiveness of specific components of the program.

Although there is preliminary evidence suggesting that the BrainSTARS model shows promise, there are several issues that may limit the model’s potential as an effective professional development approach. It is recommended as a manual-based intervention that can be used as a stand-alone resource,53 however, there is little evidence to suggest that this approach is effective in leading to sustained generalization of newly learned skills to the classroom.40–42 In addition, the model can benefit from integrating instructional and behavioral support methods that have been validated with students with other disabilities. In addition, like the team model, the BrainSTARS model ultimately must be evaluated to examine its impact on student outcomes.

Summary of evidence of impact

The TBI Consulting Team and BrainSTARS models incorporate many of the features recommended for effective professional development. The team model includes training in a range of instructional and behavioral support strategies, offers direct training in the instructional setting, and includes specific, ongoing performance feedback. Similarly, the BrainSTARS model involves direct training in a range of strategies and can include classroom consultation in implementation of new strategies. Preliminary evidence suggests that both models are effective in helping teachers feel more prepared and knowledgeable in working with students with TBI. However, data on the team model are currently limited to program evaluation statistics on the number and types of training provided, the numbers of educators served, and the changes in knowledge and self-efficacy for team members. Likewise, in spite of published pilot data on BrainSTARS, these data are limited to perceived changes in student behavior, which are not validated by other measures. Thus, the lack of evidence of impact on student outcomes prevents either model from being identified and disseminated as an evidence-based educational practice.

CONCLUSION

As educators increasingly recognize their need for additional training to address the challenges of students with TBI,57 research on effective professional development practices can guide training in this high-need area. The literature suggests that training and support for educators must include training in evidence-based interventions, supervised practice in both the training site and classroom, and continued mentoring, feedback, and consultation in trainees’ classrooms. Knowledge of this research, in addition to years of experience in classrooms, led Ylvisaker et al17 to argue that learning new skills within the environment where they will be used is no less important for teachers than for children; contextual learning is critical for the generalization of professional development from training site to classroom and for maintenance of teacher skills over time.17,18

Two models currently in use incorporate features of effective professional development and could be readily disseminated and adopted nationally. However, both models lack evidence of impact on student outcome, the gold standard for evaluating the effectiveness of professional development models.55,58–59 Unfortunately, at this time, funding for both models is limited to model implementation rather than research on efficacy. Future research should focus on the effects of the team and BrainSTARS models using validated academic and behavioral measures in the school context. In addition, it remains important to systematically examine the salient features of these models. For example, Ylvisaker et al recommended investigating the effectiveness of consultation and ongoing support for educators using trained peer consultants versus full-time TBI consultants.17 Additional questions related to implementation of these models should be examined: Do the entry-level consulting skills of team members predict their success? Does individualized consultation provide better results than a standardized curriculum or is standardization the key? As Ylvisaker et al note,17 conducting this type of applied educational research—in the school setting with “everyday people”—is extremely challenging. Nonetheless, given the current emphasis on improving student performance20 and the urgent needs of students with TBI, research to validate these promising practices should be a high priority in the field of pediatric brain injury.
REFERENCES


