Research-Based Educational Practices for Students With Autism Spectrum Disorders

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Autism spectrum disorder (ASD) has become the fastest growing disability in the United States, with current prevalence rates estimated at as many as 1 in 110 children (CDC, 2010). This increase in the number of students identified with ASD has significant implications for public schools. The most popular research-based educational practices for teaching this population, explored in the pages that follow, include applied behavior analysis (ABA); the Developmental, Individual-Difference, Relationship-Based model (DIR/Floortime); the Picture Exchange Communication System (PECS); social stories; and Treatment and Education of Autistic and Communication related handicapped CHildren (TEACCH).

In 1990, while amending the Education for All Handicapped Children Act, Congress expanded the number of disability categories eligible to receive special education services in public schools by including autism. Autism is a developmental disability that significantly affects an individual's verbal and nonverbal communication as well as social interaction. It is typically evident before age 3 and adversely impacts a child's educational performance. Other characteristics commonly associated with autism include: (a) engagement in repetitive activities and stereotyped movements, (b) poor eye contact, (c) difficulty socializing with others, (d) resistance to changes in daily routines, and (e) unusual responses to sensory experiences such as loud noises (Individuals With Disabilities Education Act [IDEA], 2008). Although the intelligence quotient (IQ) distribution for specific types of autism resembles that of the general population, there appears to always be significant differentiation between written and oral language skills, marked emotional difficulties recognized by parents and teachers but not by the students themselves, and sensory problems similar to persons who function at a much lower cognitive level (Barnhill, Hagiwara, Myles, & Simpson, 2000). As a result, children with autism, regardless of whether they are high or low functioning, have difficulty with peer relationships and understanding social situations (Kasari, Freeman, Bauminger, & Alkin, 1999).

Autistic Spectrum Disorders

Autism is a disorder that adversely affects a child's communication, socialization, and interests prior to age 3, with the average onset at 15 months (Hutton & Caron, 2005). One aspect of *autism* that distinguishes it from other disabilities is that the term refers to a spectrum or multiple types of similarly related disorders. Hence, the disability is more commonly referred to as *autism spectrum disorder* (ASD), with symptoms ranging from mild cognitive, social, and behavioral deficits to more severe symptoms in which children may suffer from intellectual disabilities and be nonverbal. There are five subtypes of ASD.

Autistic Disorder

Approximately one third (35%–40%) of children with autism are nonverbal (Mesibov, Adams, & Klinger, 1997).

The majority of students diagnosed with autism have IQ scores categorizing them with intellectual disability, with only one third (25%–33%) having an IQ in the average or above-average range (Heflin & Alaimo, 2007).

Asperger's Syndrome

Individuals with Asperger's syndrome typically do not exhibit delays in the area of verbal communication, and often develop large vocabularies. However, they do show impairments in their ability to understand nonverbal communication or the pragmatics of language. As a result, even though many individuals may be very high functioning cognitively (e.g., Temple Grandin, an internationally renowned author) they often experience significant social skill deficits.

Childhood Disintegrative Disorder (CDD)

CDD is a very rare disorder (1/50,000) that typically affects males. It is characterized by a period of normal development followed by an onset of autism-related symptoms, including marked losses of motor, language, and social skills. Symptoms may appear as early as age 2, although most develop the symptoms between 3 and 4 years of age (National Institute of Mental Health, 2008).

Rett Syndrome

In contrast to CDD, Rett's is a rare genetic disorder (1/15,000) that almost exclusively affects females. The disorder is characterized by a period of normal development followed by a deceleration of head growth accompanied by an increase in autism-related symptoms (between 6 and 18 months). Other symptoms include regression in mental and social development, loss of language, seizures, and loss of hand skills that results in a constant hand-wringing motion (Heward, 2009).

Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS)

PDD-NOS is most commonly used to describe children who exhibit at least one characteristic of an ASD subtype, but do not meet all of the specific diagnostic criteria (American Psychiatric Association, 2000). As a result, children who suffer from a qualitative difference from their peers in communication, socialization, or interests and activities may receive a diagnosis of PDD-NOS.

Increase in Prevalence Rates of ASD

Perhaps the most alarming aspect of ASD for school systems has been the dramatic and continued increase in prevalence rates of ASD across the United States over the past 2 decades. When a new disability first becomes eligible for special education services, it is often anticipated prevalence rates will rise as school systems begin to actively screen children for the disability. This increase in numbers of children served should be expected within the first several years, as was seen with the increased prevalence of traumatic brain injury (TBI), which was added as a disability category the same year as autism. However, after 2 years, the growth rate for children identified with

TBI began to plateau, while the prevalence rate for children with ASD has continued to grow nearly 2 decades later (Newschaffer, Falb, & Gurney, 2005).

In 1992, the year following ASD eligibility under IDEA, only 5,415 students with ASD were declared eligible for IDEA services (U.S. Department of Education, 1995), representing less than one percent (.1%) of all students with disabilities. A decade later the number of students receiving special education services for ASD reached 97,204 (1.66% of all students with disabilities; U.S. Department of Education, 2003) an increase of 1,708%. In comparison, the percentage increase for all disabilities during this same period was just 30.38%. By the last count, the prevalence rate has continued to increase, surpassing a quarter million students (292,818), and now accounts for 4.97% of all students with disabilities (U.S. Department of Education, 2008). This represents a dramatic increase of 201.24% since 2002, and a 5,307.53% increase since the category was first established. The Centers for Disease Control and Prevention (CDC)'s Autism and Developmental Disabilities Monitoring Network estimated that approximately 1 in 110 children may have ASD (CDC, 2010).

Causes of Autism

The etiology of ASD is currently unknown. The combination of skyrocketing prevalence rates and lack of knowledge regarding the cause of ASD has sent concerned parents and educators searching for answers through both traditional (e.g., news media and professional journals) and informal (e.g., World Wide Web blogging) informational outlets. Unfortunately, this has sometimes resulted in further confusion as consumers are left to sift through a combination of research, speculation, and misinformation for answers. Given that ASD is a spectrum of disorders, it is very likely there are multiple causes (Halsey, Hyman, & the Conference Writing Panel, 2001); current research focuses on both biological and environmental factors. From a biological or genetic perspective,

researchers have observed structural and chemical differences in the brain of children with ASD as early as the first trimester's development of the fetus (Halsey et al., 2001). These findings, coupled with increased prevalence rates among family members with a history of the disorder, add credence to possible genetic causes.

Related to the biological theory is the controversial view that ASD is caused by a compromised immune system resulting from exposure to vaccinations. As a result, there has been significant concern over the use of childhood vaccinations, specifically those containing thimerosal, a mercury-based preservative. The National Institutes of Health (NIH), the American Academy of Pediatrics, and several other medical organizations stress there is no research to support this link (Halsey et al., 2001). Medical professionals emphasize that most vaccinations developed after 2001 no longer contain thimerosal, and caution that the increasing trend of parental refusal to vaccinate their children has resulted in increased outbreaks of the potentially fatal childhood diseases these vaccinations were designed to prevent. Still, there is a continued call for research to further explore if certain children are more susceptible to developing degenerating types of ASD after being administered vaccinations, especially because the age at which many vaccinations are administered correlates with the onset of the degenerative forms of ASD.

Although there is also concern that ASD may result from environmental toxins, there has been no empirical research to support this claim. Heflin and Alaimo (2007) cautioned that although it has been observed that specific geographical areas have been shown to contain higher concentrations of ASD, this may be the result of families either (a) moving to areas that provide better educational services for their children with ASD, or (b) these locales are more effective at screening and identifying the disorder.

Implications for Schools

The continued increase of students identified with ASD has placed significant stressors on public schools and the educators that serve them. Points of contention between parents and school districts include (a) eligibility and services provided, (b) educational placement (e.g., least-restrictive environment), and (c) instructional methodologies (Yell, Katsiyannis, Drasgow, & Herbst, 2003; Zirkel, 2002).

In respect to eligibility and services, Yell and Drasgow (2000, p. 213) recommended that (a) school districts ensure timely eligibility decisions based on evaluations by professionals with experience in ASD, (b) educators develop individualized education programs (IEPs) that address all the areas of need identified in the evaluation, and (c) services identified in the IEP result in meaningful educational benefit to the student (e.g., districts must monitor student progress toward IEP goals and objectives). In accordance with federal law, districts must place students with disabilities in integrated settings to the maximum extent appropriate and adopt empirically validated instructional strategies and programs. In addition, using empirically validated methodologies is particularly important given the emphasis of the No Child Left Behind Act of 2001 on incorporating evidence-based methodologies and related provisions in IDEA regarding services outlined in a student's IEP (see Simpson, 2005). Specifically, IEPs require "a statement of the special education and related services and supplementary aids and services, based on peer-reviewed research to the extent practicable" (IDEA, 20 U.S.C. & 1414 [d][1][A][i][IV]).

Unfortunately, given the number of non-evidence-based interventions currently marketed for the treatment of ASD (e.g., facilitated communication, holding therapy, secretin therapy), selecting efficacious interventions can be a challenging proposition for both the lay and professional consumer alike. Table 1 summarizes the most popular research-based educational practices for teaching students with

Table 1. Evidence-Based Interventions for Students With Autism Spectrum Disorders

Intervention	Program Description	Demonstrated Efficacy	Internet Link
Developmental, Individual-Difference, Relationship-Based Model (DIR/Floortime; Wieder & Greenspan, 2001)	Through challenging yet child-friendly play experiences, clinicians, parents, and educators learn about the strengths and limitations of the child, therefore gaining the ability to tailor interventions as necessary while strengthening the bond between the parent and child and fostering social and emotional development of the child. *Time requirement:* 14–35 hours per week	Increased levels of: • Social functioning • Emotional functioning • Information gathering *For ages:* Approximately 2–5 years	www.icdl.com This Interdisciplinary Council on Developmental and Learning Disorders site allows professionals to learn more about the DIR/Floortime model, DIR institutions and workshops, and current research regarding DIR/Floortime.
Discrete Trial Training (DTT; Lovaas, 1987)	Intervention that focuses on managing a child's learning opportunities by teaching specific, manageable tasks until mastery in a continued effort to build upon the mastered skills. *Time requirement:* 20–30 hours per week across settings	Increased levels of: • Cognitive skills • Language skills • Adaptive skills • Compliance skills *For ages:* Approximately 2–6 years	www.helpingtogrow.istores.com www.aba.insightcommerce.net www.adaptivechild.com These commercial sites provide opportunities to purchase programs and adaptive equipment.
Lovaas Method (Lovaas, 1987)	Intervention that focuses on managing a child's learning opportunities by teaching specific, manageable tasks until mastery in a continued effort to build upon the mastered skills. *Time requirement:* 20–40 hours per week	Increased levels of: • Adaptive skills • Cognitive skills • Compliance skills • Language skills • IQ • Social functioning *For ages:* Approximately 2–12 years	www.lovaas.com Official site for Lovaas Institute that provides detailed information about Lovaas method, success stories, services, and products available.
Picture Exchange Communication System (PECS; Bondy & Frost, 1994)	Communication system developed to assist students in building fundamental language skills, eventually leading to spontaneous communication. The tiered intervention supports the learner in learning to identify, discriminate between, and then exchange different symbols with a partner as a means to communicate a want. *Time requirement:* As long as the child is engaged, typically 20–30 minutes per session	Increased levels of: • Speech and language development • Social-communicative behaviors *For ages:* Approximately 2 years–adult	www.PECS.com Official site; provides information regarding PECS training courses, consultation, certification, and products.
Social stories (Gray & Garand, 1993)	Personalized stories that systematically describe a situation, skill, or concept in terms of relevant social cues, perspectives, and common responses, modeling and providing a socially accepted behavior option. *Time requirement:* Time requirements vary per story; approximately 5–10 min prior to difficult situation	Increased levels of: • Prosocial behaviors *For ages:* Approximately 2–12 years	www.thegraycenter.org This site provides information about resources available through the Center, including products on how to make and use social stories. The site also provides general information about autism and research that supports the use of social stories.
Treatment and Education of Autistic and Communication related handicapped CHildren (TEACCH; Schopler & Reichler, 1971)	Intervention that supports task completion by providing explicit instruction and visual supports in a purposefully structured environment, planned to meet the unique task needs of the student. *Time requirement:* Up to 25 hours per week (during the school day)	Increased levels of: • Imitation • Perception • Gross motor skills • Hand–eye coordination • Cognitive performance *For ages:* Approximately 6 years–adult	www.teacch.com The site is operated through a division of the University of North Carolina Department of Psychology and provides links to regional centers, programs and services, as well as access to current research and publications supporting the method.

ASD, a good starting point for educators seeking effective interventions.

Evidence-Based Educational Programs for Students With ASD

Applied Behavior Analysis (Lovaas/Discrete Trial Training)

In 1957, noted behaviorist B. F. Skinner extended the concept of operant conditioning and rewarding positive behaviors to verbal behavior—meaning behavior is under the control of consequences mediated by other people. Skinner's research shaped the way researchers and educators alike looked at behavior. His research became a catalyst for further investigation into how theories of behavior, referred to as *applied behavior analysis* (ABA), could be used within educational settings. Generally speaking, ABA is a systematic process of studying and modifying observable behavior through a manipulation of the environment (Chiesa, 2004). The theory characterizes the components of any behavior by an A-B-C model: the antecedent to the behavior (A; stimulus/event that occurs prior to the behavior), the behavior itself (B; child's action in response to a stimulus), and the consequence (C; outcome or result of the behavior). In recent years, the principles of this theory of behavior have been used to create a behavior modification program sharing the same name, designed for the treatment of individuals with cognitive and behavioral deficits, including ASD.

Clinical psychologist Ivar Lovaas first provided evidence of the effectiveness of ABA programs for children with ASD. In this seminal study (Lovaas, 1987), one group of children less than 4 years old received an intensive treatment of ABA called discrete trial training (DTT) over a span of 2 to 3 years. DTT is an instructional strategy in which a specific task (also called a trial) is isolated and taught by being repeatedly presented to the student. Responses are recorded for each command and the trial is continued until the student demonstrates mastery of the task. Specifically, DTT consists of

(a) presenting a discriminative stimulus to the student (e.g., teacher asks student what sound the letter *p* makes), (b) occurrence or approximation of target response from the student (e.g., student attempts to make the *p* sound), (c) delivery of reinforcing consequence (e.g., teacher claps hands and smiles replying with the proper sound of the letter *p*), and (d) specified intertrial interval (e.g., teacher repeats request after specific lapsed time).

In order to promote success, ABA programs require consistent, intense, sometimes almost constant feedback and correction of a child's behavior. Therefore, intense one-on-one instruction is recommended at the beginning of the intervention (e.g., 20–30 hours per week), and parent participation is crucial to help ensure learned behaviors generalize across environments (e.g., home and school). As the new behavior replaces the old behavior and becomes more automatic, the parent or teacher implementing the intervention must methodically lessen interaction and feedback with the child during the targeted behavior.

Lovaas (1987) reported that nearly half (47%) of the children in the ABA program achieved higher functioning in comparison to only 2% of the control group not receiving treatment. Though this particular study was criticized for questionable research practices, it has since been replicated with similar results (Cohen, Amerine-Dickins, & Smith, 2006; Howard, Sparkman, Cohen, Green, & Sanislaw, 2005). This body of research includes several studies which reported half (50%) of the children with ASD treated with ABA prior to age 4 showed significant increases in IQ, verbal ability, and/or social functioning (Lovaas, 1987). Even those who did not show dramatic improvements had significantly better improvement than matched children in the control groups. In addition, some

children who received ABA therapy were eventually able to attend classes with their nondisabled peers. This research suggests intensive ABA interventions implemented early in a child's development can result in long-term positive outcomes. ABA and DTT have an extensive body of research that supports its use in academic and behavior interventions for children with ASD (Simpson, 2004) as well as other intellectual disabilities (Iwata et al., 1997), and are considered to be scientifically based practices for treating individuals with ASD (Simpson, 2005).

> The DIR model serves as a framework to understand the developmental profile of an infant or child and the family.

Developmental, Individual-Difference, Relationship-Based Approach Model/Floortime

The Developmental, Individual Differences, Relationship-Based model (DIR; Wieder & Greenspan, 2001) is a comprehensive, interdisciplinary approach to treating children with disabilities, specifically those with ASD. It focuses on the child's individual developmental needs, including social-emotional functioning, communication skills, thinking and learning processes, motor skills, body awareness, and attention span. The DIR model serves as a framework to understand the developmental profile of an infant or child and the family by developing relationships and interactions between the child and parent. It enables caregivers, educators, and clinicians to plan an assessment and intervention program that is tailored to the specific needs of the child and their family. It is not necessarily an intervention, but rather a method of analysis and understanding that helps organize the many intervention components into a comprehensive program (Wieder & Greenspan, 2001).

A vital element of the DIR model is Floortime (Wieder & Greenspan, 2001). Floortime serves both as an intervention and as a philosophy for interacting with children. It aims to create opportunities for children to experience the

critical developmental stages they are lacking through intensive play experiences. It can be implemented as a procedure within the home, school, or as a part of a child's different therapies. A Floortime program initially involves one-on-one experiences between the parent or caregiver and the child. These experiences are typically 20- to 30-minute periods when parents literally get on the floor with their children and interact and play in a way that challenges typical behaviors (e.g., repetitive movements, isolation, inappropriate play) and encourages appropriate, interactive play and socialization through parent-directed modeling and prompting.

This intervention aims to train parents and teachers to engage the emotions of even the most withdrawn toddler by entering the child's world. School systems sometimes incorporate aspects of this model into their programs but generally do not make this their primary means of educating young children with ASD. Controlled research supporting Floortime is limited, but supports a positive outcome for children with ASD. A pilot study using the PLAY Project Home Consultation program (see http://www.playproject.org/), a training program for parents of young children with ASD incorporating Floortime (Wieder & Greenspan, 2001), found that nearly half (45.5%) of the children made significant functional developmental progress through the program and reported a 90% approval rating from parents involved in the program (Solomon, Necheles, Ferch, & Bruckman, 2007).

With its strong emphasis on social and emotional development, the Floortime model (Wieder & Greenspan, 2001) may be a natural complement to a behavioral teaching program. Further research is needed promoting Floortime, but it is currently being used successfully by families who prefer a play-based therapy as a primary or secondary treatment, especially for toddlers and preschoolers (Wieder & Greenspan, 2001).

Picture Exchange Communication System

Typical learners are constantly communicating needs, wants, and desires through socially acceptable verbal expressions and physical gestures that may not come naturally to individuals with ASD. An increasingly common intervention used to enhance communication skills of children with ASD is the Picture Exchange Communication System (PECS; Bondy & Frost, 1994). PECS is a multitiered program that promotes communication through the exchange of tactile symbols and objects. Symbols may include photographs, drawings, pictures of objects, or objects that a child is taught to associate with a desirable toy, person, or activity.

The three instructional phases of PECS teach a child to (a) request an item or activity by giving a corresponding picture, symbol, or object to his/her partner, (b) generalize the activity by bringing the request symbol to the partner who may be located in different areas of the room, and (c) discriminate between two different request symbols before bringing it to the partner (Lund & Troha, 2008). The six-phase PECS program extends beyond discrimination of two symbols to the discrimination of many symbols and incorporates more complex language exchange between interventionist and student (Bondy & Frost, 1994).

PECS (Bondy & Frost, 1994) requires the instructor to teach the child to request a desired activity through modeling (i.e., demonstration of desired behavior). The child is prompted by the teacher to use the tactile symbols to make a specific request (e.g., student points to picture of glass of water to express desire for a drink). It is important to create symbols that are significant and personal to the child, which will accurately communicate what the child is requesting. The child is positively reinforced for correctly using the appropriate symbols and essentially associates the symbol with a desired activity. This in turn increases the probability the child will continue to use the symbol to request that specific activity (e.g., water break)

in the future. It is equally important that the child is corrected whenever the symbols are used incorrectly (e.g., the child screams for drink), therefore decreasing the chances that an inappropriate method of communication will be repeated.

The various tiers of PECS (Bondy & Frost, 1994) gradually increase in complexity as tasks become more difficult. Although verbal and gestural prompting (e.g., pointing) may be necessary at the beginning of each phase, it should be faded as the student demonstrates mastery of the skill (e.g., teacher refrains from asking the child which picture will ask for water once the child consistently uses the object correctly). Teaching the child to generalize the behavior learned is critical for the behavior to be functional and applicable to daily life. Behavior generalization is naturally incorporated into PECS during the second stage when the partner physically moves farther away from the child, and during the third stage when the child is taught to discriminate between different symbols (e.g., glass of water and glass of milk).

Research supports PECS (Bondy & Frost, 1994) as a promising practice for teaching individuals with ASD how to more appropriately communicate requests (Carr & Felce, 2006; Ganz & Simpson, 2004; Simpson, 2005). Due in part to the prescribed order of teaching, PECS may be very beneficial for individuals who are either nonverbal or have limited communication skills. Lund and Troha (2008) also provided preliminary evidence that a modified version of PECS using objects as symbols in the place of pictures may be used successfully to facilitate communication skills for children who have the comorbid condition of ASD and blindness.

Social Stories

Social stories (Gray & Garand, 1993) provide a brief descriptive story for children to help them better understand specific social situations. Social stories describe "a situation, skill, or concept in terms of relevant social cues, perspectives, and common responses in a specifically defined

style and format" (The Gray Center for Social Learning and Understanding, n.d.). The goal of social stories is not to change an individual's behavior but rather to expose the individual to a better understanding of an event, thereby encouraging an alternative and proper response. Less formally, the teacher and student may create personalized stories that explicitly inform the child what to expect in a given situation that has proven to be difficult in the past (e.g., riding the school bus, participating in an assembly), and in turn how the child should act in the particular situation. Social stories can be used either to encourage replacement of a child's maladaptive behaviors (e.g., screaming to get a teacher's attention) or to promote prosocial behaviors (e.g., introducing yourself to person entering a room; Spencer, Simpson, & Lynch, 2008).

Social stories are typically presented to the child before the situation occurs as a way to help rehearse the scenario. For example, if a child has difficulty riding the school bus, the teacher and student could develop a social story regarding how the student should board and ride the bus, and why that behavior is necessary. The story should also include positive behaviors that the child does well, other events that may serve as behavioral triggers (e.g., other children violating student's personal space), and how the individual could best respond to each situation (Sansosti, Powell-Smith, & Kincaid, 2004; Scattone, Wilczynski, Edwards, & Rabian, 2002). In addition to reading the story, the child may require prompting during social situations, and may need to practice the skill presented in the story. Recognition of appropriate behavior by the student is vital, reinforcing appropriate behaviors with an ultimate goal of self-regulation and management (Spencer et al., 2008).

Social stories should be written and illustrated at a level in keeping with the cognitive ability of the student they serve. Gray developed clear guidelines (see The Gray Center for Social Learning and Understanding, n.d.) for developing a story, which typically ranges

from 5 to 10 sentences. Stories should: (a) define a specific target behavior of concern, (b) identify an appropriate replacement behavior, (c) be written from the child's perspective, (d) include pictures or drawings to help the child relate to the desired behavior, and (e) include a ratio of one directive sentence for every two to five sentences that are either descriptive, perspective, or both.

Specifically, directive sentences define the goal of the story and provide responses or behaviors the student is expected to perform. *Descriptive* sentences provide details regarding the event, setting, thoughts, or actions of people in a similar situation. *Perspective* sentences are usually related to consequences or outcomes of the situation and describe how other people may react or feel based on the action or inaction of the main character of the story. Additionally, stories may include *affirmative* sentences that provide statements of social value (Ali & Frederickson, 2006; Sansosti et al., 2004), *control* sentences that reinforce the student's method of self-regulation and affirm the right to choose, and *cooperative* sentences that provide names of responsive people who may assist in the student's efforts or may be impacted by their choices. Some of the sentences may also have blanks for the student to fill in (Ali & Frederickson, 2006). As with any good story, a title, introduction, body, and conclusion are important elements (Quilty, 2007). The format of the social story should be predictable. It should not merely be a list of tasks, but should describe behaviors rather than simply directing the child.

Although the research is not yet extensive, the use of social stories is considered a promising behavioral intervention for children with ASD (Simpson, 2005), helping to increase desirable prosocial behaviors such as

hand washing, delayed echolalia, following directions, and using a quiet voice (as reviewed by Sansosti et al., 2004); and to decrease undesirable, maladaptive behaviors such as calling out in class (Crozier & Tincani, 2005), hitting, screaming, falling from a chair, and crying while completing homework (Adams, Gouvousis, VanLue, & Waldron, 2004). Although full confirmation supporting the efficacy of social stories for children with ASD is premature until larger scale research studies are conducted, early findings appear to be very promising.

Social stories can be used either to encourage replacement of a child's maladaptive behaviors . . . or to promote prosocial behaviors.

Treatment and Education of Autistic and Communication Related Handicapped CHildren (TEACCH)

The TEACCH program has been used to educate children with ASD for over 3 decades. Based on Eric Schopler's work in the 1970s (e.g., Schopler & Reichler, 1971), TEACCH uses structured teaching, which highlights the use of visual supports, to maximize the independent functioning of a child with ASD and/or other related disorders (Hume & Odem, 2007). TEACCH is composed of four critical, structured teaching components: (a) physical structure and organization of the work space, (b) schedules indicating details about the required task, (c) work systems depicting detailed expectations of the individual during the task, and (d) task organization explicitly describing the learning task. The TEACCH system requires the environment to be arranged to meet the unique needs of the child in a given situation. For example, if a child is expected to perform specific homework tasks, the TEACCH program requires the desk area at home be set up in a way that prompts the child to self-monitor personal behavior while working through the tasks necessary to complete the homework assignment (e.g., take out homework, put name on page, read

directions, ask for assistance, put completed homework in folder, place folder in book bag). TEACCH may also be used with older students to help prepare them for the workplace by maximizing task independence. For example, a worker whose task it is to sort and stack different materials can use TEACCH to remain on task and efficiently perform the responsibilities required with minimum supervision.

TEACCH requires that the child receive explicit instruction on how to maximize the use of the physical work space through either physical or visual prompts. The adult supervisor may model how the organized space is used to cue different performance steps and monitor the individual as these tasks are being mastered. Primary reinforces are frequently used to increase desired behavior (e.g., verbal praise, recognition, time for desired activity). Staff should prompt and reward the student as necessary, decreasing prompts as the student becomes more self-sufficient and requires less adult supervision.

Although there have been no large-scale studies to date investigating TEACCH, it has been found to be a promising intervention for students with ASD (Simpson, 2005). Studies have demonstrated increases in fine and gross motor skills, functional independence, on-task behavior, play behavior, imitation behavior, and other functional living skills, while reducing the need for teacher prompts (Hume & Odom, 2007; Tsang, Shek, Lam, Tang, & Cheung, 2007). TEACCH has demonstrated efficacy for children with ASD across various ages and ability levels.

Final Thoughts

Identifying effective interventions to use with children who have ASD can be challenging for educators and parents alike, especially when various fads and "quick-fix" solutions may receive as much if not more press than evidence-based approaches. The current emphasis on implementing evidence-based interventions leads educators and parents to seek out programs supported by data from empirical research. Although there is a growing body of quality research available on effective interventions for children with ASD, it is still fairly limited, especially given the increasing prevalence rates and wide range of educational, verbal, and social skill deficits associated with this disability.

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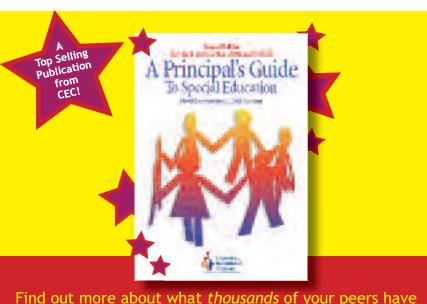
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