What are appropriate interventions and treatment programs for children with severe autism in an educational setting?

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Abstract

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The questions this project will address include: (1) What interventions and treatment program for children with severe autism are available to use in an educational setting, (2) What research supports interventions and treatment programs for children with severe autism, (3) How can they be implemented into the classroom, and (4) How can professional development sessions be implemented to assist teachers?

The professional development sessions described in this project include four two-hour sessions. The purpose of these sessions is to introduce early childhood special education teachers and paraprofessionals, support staff, and administrators to an overview of autism, and to provide interventions and treatment programs for children with severe autism.

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What are Appropriate Interventions and Treatment Programs for Children with Severe Autism in an Educational Setting?

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ABSTRACT

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The professional development sessions described in this project include four two-hour sessions. The purpose of these sessions is to introduce early childhood special education teachers and paraprofessionals, support staff, and administrators to provide an overview of autism and provide interventions and treatment programs for children with severe autism. The sessions will include specific descriptions of four interventions and treatment programs that are more commonly used in educational settings. These interventions and treatment programs would be more likely to be implemented in the structure of our early childhood special education classrooms at Jones Early Childhood Center.
ACKNOWLEDGEMENT

I would like to thank my husband and children for supporting me throughout this project. A special thanks to my parents and in-laws for watching the kids while I was glued to the computer! Angela- thanks for being only a phone call away! Very special thanks to Dr. Edmiaston and Dr. May for inspiring me to grow as an educator throughout this master program.
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CHAPTER I
INTRODUCTION

Autism Spectrum Disorders is a complex developmental disability that typically appears during the first three years of life. According to the Centers for Disease Control and Prevention as reported by Autism Speaks (2006), autism spectrum disorders (ASD) is the result of a neurological disorder that affects the functioning of the brain. Its associated behaviors have been estimated to occur in as many as 1 in 166 individuals. ASD is four times more prevalent in boys than girls and knows no racial, ethnic, or social boundaries. Family income, lifestyle, and educational levels do not affect the chance of autism’s occurrence (http://ourspecialkids.org/autism.html).

Researchers have yet to find a specific cause for autism, but there are a variety of theories. Brain, genetics, environmental, immune system, immunizations, and pregnancy are potential causes for ASD that are being researched. According to Exhorn & Volkmar (2005), research findings show children with ASD to have some parts of their brain over-connected or under-connected. Studies on brain circuitry suggest that people with ASD process information in different parts of their brains from those in typical people. For example, they recall letters of the alphabet in the part of the brain that normally processes shapes. According to Holmes (1998), there appears to be a genetic link because many children with autism have family histories of autism or related disabilities. The research of Dr. Edwin Cook of the University of Chicago found that if one identical twin has an ASD, there was a 90 percent chance that the other will have ASD as well (Exkorn & Volkmar, 2005). According to research conducted at the Yale Child Study Center, if you
give birth to a child with an ASD, there is a one-in-twenty chance of giving birth to another child with an ASD (Exkorn & Volkmar, 2005).

Some parents reported that their children were developing typically up until a certain age, at which they demonstrated symptoms of ASD. According to Diana Parsell (2004), it may be possible that these children were born with a genetic disposition to ASD, whose onset was triggered by an environmental factor. There have not been any triggers identified yet; however, some parents and researchers suggest factors such as viral infections; exposure to environmental chemicals, such as lead and mercury; metabolic imbalances; or childhood immunizations.

Some theories suggest that measles, mumps, and rubella (MMR) vaccine can overwhelm an immune system that is already struggling from the effect of thimerosal contained in previous vaccines. However, according to organizations such as the Centers for Disease Control and Prevention, the American Academy of Pediatrics and the World Health Organization, there is not enough evidence to support the theory that vaccines – specifically thimerosal-containing vaccines – cause children to develop ASD.

Some researchers speculate that pregnant women who were given the labor-inducing drug pitocin or who have yeast infections, poor diet, or hormonal or immune system change during pregnancy have a higher chance for giving birth to children with ASD. Dr. Andrew Zimmerman, a pediatric neurologist, believes that environmental influences in utero, such as hormones triggered by a mother’s stress, may contribute to ASD by disrupting normal early development (Parsell, 2004). Limin Shi, Fatemi, Sidwell, & Patterson (2003) examined babies of pregnant mice who were infected with a
modified human-flu virus. Their babies, when grown, exhibited similar behaviors to children with ASD. These researchers suggest that the altered brain development in the mice wasn’t the direct result of the viral infection in the fetus, but was related to the natural immune response in the mother. If the mother couldn’t fight off the virus, there was a chance it could cross over and affect the brain development in the fetus (Limin Shi, Fatemi, Sidwell, & Patterson, 2003).

There are many characteristics or symptoms of ASD and the signs or red flags can be visible as early as one year old (www.autismspeaks.com) and can include:

(a) No big smiles or other warm, joyful expressions by six months or thereafter; (b) No back-and-forth sharing of sounds, smiles, or other facial expressions by nine months or thereafter; (c) No babbling by 12 months; (d) No back-and-forth gestures, such as pointing, showing, reaching, or waving by 12 months; (e) No words by 16 months; (f) No two-word meaningful phrases (without imitating or repeating) by 24 months; (g) Any loss of speech or babbling or social skills at any age. (¶3)

According to The Autism Sourcebook (2005), if a child has ASD, they may prefer to play alone, lack eye contact, and are oblivious to everyone’s feelings. A child may display ritualistic behaviors such as lining up toys on the floor in specific order at specific times or engage is obsessive behaviors such as opening and closing doors, turning light switches on and off. They may not like to be touched, hugged, or cuddled. Some children have unusual sleep patterns and eat only limited, specific foods. They may have little or no speech and demonstrate idiosyncratic language such as endless repeating of cartoons, echoing or repeating words or phrases, or making unusual sounds. A child may
have atypical behaviors such as rocking, twirling, preoccupations with a string or other small item (Neisworth & Wolfe, 2005).

According to The Autism Sourcebook (2005), the word autism is the catch-all term that many people use when referring to the spectrum of autistic disorders. The Diagnostic and Statistical Manual, Fourth edition, Text Revision (DSM-IV-TR) is the official manual used by physicians and mental health professionals for diagnosing children on the autism spectrum. The more current term for autism is autism spectrum disorders (ASD), which includes the following five diagnoses: Autistic Disorder, Asperger’s Disorder, Childhood Disintegrative Disorder (CDD), Rett’s Disorder, and Pervasive Development Disorder-Not Otherwise Specified (PDD-NOS), see Appendix A for definition of terms (Exkorn & Volkmar, 2005).

ASD is a spectrum of disorders, ranging from mild to severe. The terms high-functioning and low-functioning are sometimes used to describe where a child is on the autism spectrum (Exkorn & Volkmar, 2005). A child on the mild end (i.e., high functioning) of the spectrum may be able to function in a regular classroom and even reach the point where he or she no longer meets the criteria for autism. A child on the severe end (i.e., low functioning) of the spectrum may be unable to speak and also have mental disabilities. Children with severe autism may have aggressive behaviors, temper tantrums, severe sensory dysfunction, withdrawn feelings, and can be nonverbal (Exkorn & Volkmar, 2005).

Given such a wide range of abilities, the most effective way to educate children with severe autism is to implement appropriate interventions for each child individually.
There are interventions designed to meet the needs of children with ASD. Not all treatment approaches are equally beneficial for treating autism (Exkorn & Volkmar, 2005). There is not a one size fits all treatment approach. Since autism has many theories of causes and may different types of symptoms, it usually requires different types of interventions. Some interventions may be more appropriate for children with severe autism rather than a child with higher-functioning autism, or with Asperger's Syndrome. According to The Autism Society of America's website (2006), it states that, "Evidence shows that early intervention results in dramatically positive outcomes for young children with autism" (http://www.autism-society.org).

The intent of this project was to provide interventions and treatment programs for children with severe ASD to special education teachers and paraprofessionals, support staff, and administrators. It is important to understand that children with ASD have a wide range of abilities and needs. There are many different approaches that are appropriate to use in the classroom. Educators need to be knowledgeable about which approach is most appropriate for each child.

Overview of the Project

This project on the identification and implementation of appropriate interventions for children with severe autism in an educational setting addressed interventions and treatment programs that can be implemented in early childhood special education classrooms. The interventions and treatment programs categories included (1) Interventions Based on Formation of Interpersonal Relationships, (2) Skill-Based Treatment programs, (3) Physiologically Oriented Intervention programs and (4)
Combined programs. A description of professional development sessions was included to help teachers to implement these practices in their classrooms. The following sections describe the design, purpose, and rationale of this project.

Project Design

This project consisted of the development of professional development sessions for educating early childhood special education teachers and paraprofessionals, support staff, and administrators at Jones Early Childhood Center in Dubuque, Iowa. The professional development sessions will help teachers implement interventions and treatment programs for children with severe autism. Throughout the school year, four two-hour sessions were designed for the staff to learn about interventions and treatment programs, observe their students' needs in order to implement interventions and treatment programs into early childhood special education classrooms, and assess the child's progress.

Purpose

The purpose of this project was to introduce interventions and treatment programs which are appropriate for children with severe autism. Early childhood special education teachers and paraprofessionals, support staff, and administrators will be invited to attend professional development sessions developed in this project. The information presented will assist staff when implementing these interventions into the classroom and to help teachers in making decisions on which interventions are most appropriate for each child.

Staff will be given the opportunity to participate in the professional development activities developed in this project. In these sessions, the staff will engage in role-
playing, asking questions, discussing the interventions and treatment programs, and developing a plan for implementing them into their educational setting.

Project Rationale

ASD can occur at all intellectual levels and the resultant characteristics, difficulties in communication, social interaction, and behavior, are as unique as the individual (Fouse & Wheeler, 1998). According to The Autism Education Network (2006), many strategies emphasize highly structured and often intensive skill-oriented training that is tailored to the individual child (http://autismeducation.net). Research findings have shown that specific characteristics such as cognitive ability, communication and social skills, and behaviors such as activity level and aggression (Holmes, 1998) vary greatly across children with autism. Children with severe autism may exhibit significant behavioral difficulties, often engaging in behaviors that are harmful to themselves or others, such as self-injury or aggression, have limited abilities to understand and use language, and lack the cognitive skills needed to obtain meaningful scores standardized measures designed to measure intelligence (Holmes, 1998).

There are numerous types of interventions and treatment programs that can be effective in helping reduce symptoms associated with ASD. As a teacher, I have used a variety of interventions and treatment programs that benefit children with ASD in the classroom. I believe my students and other students with ASD could benefit from the implementation of the interventions and treatment programs discussed in this project. In my opinion, sharing the structure of my classroom and my review of the literature
through professional development sessions could highly assist teachers in the growth of students with ASD.
CHAPTER II

METHODOLOGY

As a teacher, I question that I may not be implementing the most appropriate intervention or enough interventions in my classroom. Over my three years of experience teaching children with ASD, I have had children display a wide range of abilities and needs. I have used different interventions and treatment programs. Current research and new approaches are available to inform my practices; however, I found it difficult to determine which interventions are the most appropriate for each child. The needs of each child vary so much that there is not one intervention that will work for all. I started researching more familiar interventions and treatment programs that have been used in classrooms throughout our school district. I was overwhelmed with the amount of interventions, strategies, treatment programs that are available for students with autism spectrum disorders.

Heflin and Simpson (1998), categorized interventions and treatment programs into four categories, Interventions Based on Formation of Interpersonal Relationships, Skill-Based Treatment Programs, Physiologically Oriented Intervention Programs, and Combined Programs. For the purpose of this project, I chose to review research regarding interventions and treatment programs that I felt would be useful in my classroom. I did not include Combined Programs because I would not be able to adapt a combined program in my classroom because of the current structure of my classroom and district mandates.
I became interested in developing this project because I wanted to learn more about interventions and treatment programs for children with severe autism that I could implement in my early childhood special education classroom. I created professional development sessions to share my findings with other teachers, paraprofessionals, support staff, and administration in my community.

I intend to present my findings from my review of literature at a series of professional development sessions. I will briefly discuss research findings and give an overview of interventions and treatment programs. Then, I will identify the procedures I will use in this project to guide staff on how to implement these interventions and treatment programs into their classrooms according to the needs of their student's with autism spectrum disorders.

Review of Literature

The literature reviewed for this project contains more familiar interventions and treatment programs than can be applied in my practice. The interventions and treatment programs are summarized into three categories: (a) interventions based on formation of interpersonal relationships, (b) skill-based programs, and (c) physiologically oriented intervention programs. I will present a review of literature on interventions and treatment programs that I feel are most appropriate for the structure of my classroom. The review of literature concludes with a discussion on effective professional development.

*Interventions Based on Formation of Interpersonal Relationships*

Interventions based on formation of interpersonal relationships emphasize social-affective differences as primary to cognitive and language deficits, stress the importance
of developing empathy and the ability for individuals with autism to express their attachments to others in a typical fashion (Gillberg, 1992; Sigman & Ungerer, 1984). Four interventions fall under this category, Holding Therapy, Gentle Teaching, Options, and Floor Time, which is actually a specific strategy within the The Developmental, Individual Difference Relationship-Based [DIR] Model (Greenspan & Wieder, 1997). These interventions are relationship-based approaches that seek to facilitate affect, attachment, bonding, and a sense of relatedness, and vary in their acceptance and utilization (Heflin & Simpson, 1998). In my opinion, Floor Time is most appropriate intervention for the classroom.

Stanley I. Greenspan, M.D., developer of Floor Time, has made research into a framework for the development of emotional milestones his life's work. His view of autism is thoroughly developmental. He faults most interventions for zeroing in on the initial problem area observed during diagnosis – motor, sensory, behavioral, language, etc. – rather than conceiving the child's challenge in terms of broad developmental processes across all areas (Heflin & Simpson, 1998).

The Floor Time approach is a warm and intimate way of relating to a child. A floor time philosophy means engaging, respecting and getting in tune with the child in order to help the child elaborate through gestures, words, and pretend play what is on the child's mind. The goals of Floor Time are to target personal interactions to facilitate mastery of developmental skills and help professionals see children functionally integrated and connected (www.autism-society.org). According to The Floor Time Foundation (2006), the DIR/Floor Time intervention is focused around six developmental
milestones that children should accomplish throughout their development in order to live an emotionally, healthy, and intellectual life (www.floortime.org, 2006). They include:

1. Self-regulation and Interest in the World - children should achieve this milestone by the age of 3 months.
2. Forming Relationships, Attachment, Intimacy - children should achieve this milestone by the age of 8 months.
3. Intentional Two-Way Communication - children should achieve this milestone by the age of 9 months.
4. Complex Communication (Complex Sense of Self) - children should achieve this milestone by the age of 12-18 months.
5. Emotional Ideas - children should achieve this milestone by the age of 14-36 months.
6. Emotional Thinking - children should achieve this milestone by the age of 36-48 months. (¶ 5)

According to The Floor Time Foundation (2006), Floor time is a systematic way of working with a child to help him climb the developmental ladder. This approach will take the back to the very first milestone he may have missed and begins the developmental process. By working intensively with parents and therapists, the child can climb the ladder of milestones, one rung at a time, to begin to acquire the skills he is missing (www.floortime.org, 2006). Floor Time is a five-step process that is used to support the emotional and social development of the child presented in Table 1 is discussed thoroughly by Greenspan, Wieder, and Simon (1998).
<table>
<thead>
<tr>
<th>Step</th>
<th>Activity</th>
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<tr>
<td>Step One:</td>
<td>Observation (observe the child’s facial expressions, tone of voice, gestures, body posture, and words to help you determine how to approach the child)</td>
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<td>Step Two:</td>
<td>Approach-open circles of communication (approach the child with the appropriate words and gestures, can open the circle of communication with a child by acknowledging the child’s)</td>
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<td>Step Three:</td>
<td>Follow the child’s lead (be a supportive play partner who is an “assistant” to the child and allows the child to set the tone, direct the action, and create personal dramas)</td>
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<td>Step Four:</td>
<td>Extend and explore play (make supportive comments about the child’s play without being intrusive, ask questions to stimulate creative thinking that can keep the play going)</td>
</tr>
<tr>
<td>Step Five:</td>
<td>Child closes the circle of communication (the child will close the circle when the child builds on you comments and gestures with comments and gestures of own, one circle flows into another, and many circles may be opened and closed in quick succession as you interact with the child</td>
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Greenspan and Wieder (1997) reviewed the charts of 200 children they saw for consultation or treatment over an 8-year period. All of the children had severe problems
in relating and communicating. They were diagnosed between 22 months and four years of age as having ASD. Contrary to textbook descriptions of ASD, which often indicates that children as having an early onset, more than two-thirds of the children showed relatively better development in the first year of life with a clear regression in the second year of life. All 200 cases showed auditory processing, motor planning, and sensory modulation dysfunction. After a minimum of two years of a comprehensive, relationship/developmentally based intervention program based on the Floor Time approach, 58% were deemed to have "very good outcomes" (Greenspan & Wieder, 1997).

Greenspan & Wieder (1997) divided the children's functioning into three broad groups to describe the outcomes. One hundred sixteen of the 200 children (58%) were in the "good to outstanding" outcome group, 50 (25%) were in the "medium" outcome group, and 34 (17%) continued to have significant difficulties. The results indicated that the majority of children receiving the DIR approach learned to relate and engage with warmth, trust, and intimacy and learned to interact, read, and respond to social signals. The "good to outstanding" outcome group of children was able to develop not only strong relationships and interactive capacities, but capabilities for imaginative play, creative and meaningful use of language, and reflective thinking. The children in this group are in regular schools, have meaningful relationships, and many have levels of understanding and empathy beyond their peers (Greenspan & Wieder, 1997).

The review indicated that the second group also made gains in their ability to relate and communicate with gestures. They became related to their parents, often
seeking them out in a joyful and pleasurable manner. The children were able to share attention with social, cognitive, and motor problem solving. However, children in this group were still having challenges in developing their symbolic capacities. The third group continued to have significant difficulties in both presymbolic and symbolic realms. They were unable to attend, enter into simple and complex sequences of gesturing. Some children had some symbolic capacity (sing songs or do puzzles), but were unable to imitate and use these abilities in an interactive, communicative manner. Many children in this group were making slow progress.

Wieder and Greenspan (2005) conducted a follow-up study of the sixteen children who had been diagnosed with ASD and were in the good to outstanding group (Greenspan & Wieder, 1997). This study attempted to answer the question of whether or not a subgroup of children with ASD could go beyond expectations for high-function ASD and learn to be related, empathetic, creative, and reflective thinkers.

The children in this study were all boys, ranges in age from years, 12-17, with a mean of 13.9 years. The follow-up addressed the full range of emotional, social, and sensory processing variables in addition to traditional cognitive and academic outcomes. The follow-up study included parent interviews and a completed functional emotional developmental questionnaire, child interviews, school and cognitive reports and then Child Behavior Check List that rates competence and clinical syndromes (Wieder & Greenspan, 2005). The results indicated that the children progressed out of their core symptoms and, more importantly, their core deficits. They became warm, related, and sensitive. They demonstrated competence in a full range of activities. The children did
show some anxiety and depression in their later adolescent years, however, they did not demonstrate symptoms of ASD. Some students continued to have sensory challenges; they did not affect their relating, communicating, and thinking abilities. The DIR model provides the framework for implementing floor time sessions that support the continuous flow of engagement, symbolic play and higher-level thinking. Greenspan & Wieder (2005) believe the most important lesion is that progress can continue into adolescent years and further. They feel it is important to continue to try and work with children and families on the most essential capacities for relating, communicating, and thinking.

Solomon, Necheles, Ferch & Bruckman (2004) analyzed the Michigan PLAY Project and results from the community-based parent consultation adaptation of the DIR model found significant gains for a group of children with ASD in social, cognitive, and language functioning. The Playschool Model is based on a developmental and relationship framework that began in 1981 at the University of Colorado’s Health Sciences Center. In 1998, the focus of the model shifted to home and preschool settings involving typically developing peers. There is a need for evidence-based data regarding Floor Time. There are organizations and projects adapting the DIR model, but accessing the data has been difficult.

**Skill-Based Treatment Programs**

Skill-based treatment programs differ philosophically from the relationship-based interventions in that the intent is to develop or support the demonstration of specific skills rather than promote relatedness and attachment. Skill-Based programs focus and assess individual’s performance and target specific skills to teach and improve adaptive
functioning (Heflin & Simpson, 1998). There are ten interventions and treatment programs included in this category, Picture Exchange Communication System (PECS), Azrin 24-Hour Toilet Training, Social Stories, Facilitated Communication, Joint Action Routines, Visual Schedules, Fast ForWord, Lindamood-Bell, Van Dijk Approach, and Applied Behavior Analysis (ABA) and Discrete Trial Training (DTT). In my classroom, I use Joint Action Routines, Visual Schedules, PECS and DTT. Of these programs, I have found PECS and DTT to be the most beneficial programs in this category. I will discuss these below.

*Picture Exchange Communication System.* (PECS) was developed over a period of time and is primarily designed for young children with ASD (Bondy & Frost, 2002). Many young children with ASD do not use oral speech or other forms of formal communication when they enter school. When a child does not speak, the hope is for that child to learn to speak as quickly as possible. According to Bondy & Frost (2002), children with ASD are often poor imitators of actions and speech when they are first diagnosed.

According to The Pyramid Educational Consultants (2006), Andrew Bondy and Lori Frost developed 6 phases in PECS as displayed in Table 2. It is a unique training package for children and adults to initiate communication. Frost and Bondy (1994) noted improved communication for children with ASD using the PECS as well as increased spontaneous language acquisition; however, few empirical demonstrations have been reported.
Table 2

<table>
<thead>
<tr>
<th>Phase</th>
<th>Goal</th>
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<tr>
<td>Phase One:</td>
<td>Teaches students to initiate communication right from the start by</td>
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<td>exchanging a single picture for a highly desired item.</td>
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<td>Phase Two:</td>
<td>Teaches student to be persistent communicators- to actively seek out their</td>
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<td>pictures and to travel to someone to make a request.</td>
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<tr>
<td>Phase Three:</td>
<td>Teaches students to discriminate pictures and to select the picture that</td>
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<td>represents the item they want.</td>
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<tr>
<td>Phase Four:</td>
<td>Teaches students to use sentence structure to make a request in the form of</td>
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<td></td>
<td>&quot;I want ____.&quot;</td>
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<tr>
<td>Phase Five:</td>
<td>Teaches students to respond to the question &quot;What do you want?&quot;</td>
</tr>
<tr>
<td>Phase Six:</td>
<td>Teaches students to comment about things in their environment both</td>
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<td>spontaneously and in response to a question.</td>
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Schwartz, Garfinkle, & Bauer (1998) conducted a study involving 31 children enrolled in an integrated, university-affiliated preschool program that used the PECS. The purpose of this study was to examine PECS as a way of teaching functional communication skills to young children with severe communication delays. This study specifically examined the rate of acquisition of PECS for preschool children with significant disabilities. Their ages ranged from 3 to 6 years old. Twenty-nine percent of the participants were female. Sixteen children had been diagnosed with autism or
Pervasive Developmental Disorder—Not Otherwise Specified (PDD-NOS). The other children that participated in this study had been diagnosed with Down Syndrome, Angelman’s syndrome, or other developmental disabilities. All of the children had severe social, communication, and cognitive delays that qualified them for special education services.

The interventions took place in children’s classroom located in a comprehensive early childhood center that served about 170 children a year. Approximately 100 students were identified with disabilities and 30% had a diagnosis of autism or PDD-NOS. There were six preschool classrooms with a total of 15 children, 9 who had been identified with disabilities and 6 who were typically developing. The preschool met five days a week for 2 hours and 15 minutes a day.

Data was collected on all the children in the program who used PECS during the last 4 school years. The 31 children were not all enrolled in the program concurrently, and those enrolled concurrently were at different stages of PECS. The PECS training was an objective of each participant’s IEP. Data was documented when each child started the program and was tracked throughout the program.

All of the participants in the study received training in PECS. Pictures used in the PECS system were generated by the Boardmaker for Windows (1995) computer program. Both black-and-white and colored symbols were used. All children started with 2x2 inch symbols, but they became smaller as the children moved through the phases. The training program steps in this study were: basic exchange (child picks up symbol and hands it to an adult), distance and persistence (child picks up picture and hands to an
adult that has moved away), discrimination (child selects symbol from an array of more than one symbol), sentence building (child selects preferred symbol, adds it to “I want” symbol and exchanges the sentence strip with the adult), PECS with peers (child uses symbols to request items from peers) and Systematic Integration (symbols available throughout the school day used for songs, activities, and materials) (Schwartz, Garfinkle, & Bauer (1998).

All 31 participants in this study learned to use PECS system with adults and peers in their preschool classrooms. The mastery criteria required 80% or higher independent correct responses of three training sessions. On average, the preschool children learned to exchange 2x2 inch symbol with a communicative partner to receive desired item with in 2 months from the start of the training (range = 1-5 months). On average, 2 months (range = 106 months after the mastery of exchange, the children mastered the distance and persistence phase. After an average of 3 additional months (range = 1-6 months) of training, children completed the discrimination phase. On average, after an additional 4 months of training (range = 1-9 months) children mastered the sentence building phase. Finally, after 3 more months of training (range 1-12 months) the children mastered PECS with peers. Overall, 14 months on average (range = 3-28 months) after the beginning of PECS training, children were using the PECS system in a functional manner to communicate with adults and peers (Schwartz, Garfinkle, & Bauer (1998).

This data shows that 31 children with various significant disabilities progressed from having no or extremely limited functional communication skills to using the PECS to communication with adults and peers. The authors felt it was important to note that
these communication skills were taught and used in an integrated, play-based classroom. Some instruction was individualized and initial instruction was intensive, but the instruction took place in a naturalistic setting (Schwartz, Garfinkle, & Bauer (1998).

Kravits, Kamps, Kemmerer, & Potucek (2002), conducted a study in order to evaluate the effectiveness of teaching of PECS on the spontaneous communication of an elementary-ages child with ASD. They wanted to determine feasibility of use by the mother, classroom teachers, and peers across home and school environments. Also, they noted effects in conjunction with social skills training for social interaction behaviors.

Molly was a 6-year-old girl with the diagnosis of autism. At school she was integrated, with the assistance of a paraprofessional, in a half-day kindergarten program in the public school. She also received 30-60 minutes of special education services per day from the learning center teacher and language therapist. Her score on the Vineland Intelligence Scale indicated a 2 year 8 months performance level. Scores on the Wechsler Preschool and Primary Scale of Intelligence (WPPSI-R) were within the 27th percentile for verbal behavior and the 1st percentile for adaptive behavior. Her developmental age was 2-2.5 years on the Psychoeducational Profile-Revised (PEP-R) (Kravits et. al, 2002).

When prompted, Molly communicated by using 1-2 word utterances, but her speech was difficult to understand, and her frequency of initiations was very low. She used gestures and eye contact to communicate. She initiated and used more verbalizations at home with her mother than with teachers and peers at school. The PECS was chosen to provide Molly with an effective communication system across
settings and to increase her spontaneous initiations and interactions with others in her environment (Kravits et. al, 2002).

The settings for the study took place during snack and leisure time in Molly's home and play opportunities with peers during journaling and center activities at school. The materials used consisted of food, toys, and games. Graphic symbols/icons of items were taken from the Mayer-Johnson Picture Communication Symbols (1990) or were hand drawn (2 x 2-inch black and white) (Kravits et. al, 2002).

Data was recorded across settings (home, centers, and journal time) that required frequency of icon use, frequency of intelligible verbalizations, frequency of initiations, and duration of social interaction with peers. The experimental conditions included two baseline conditions and two treatment phases that occurred during play activities at home and school.

The PECS was implemented during play activities across all settings following procedures as outlined in the manual. In *Phase I, Physically Assisted Exchange*, Molly exchanged the pictures independently without the prompter’s assistance and without the hand cue from the trainer for 80% of the teaching period trials (typically 5-10 each session, with 17 trials in the initial session to teach picking up the icon and the exchange. *Phase I, Expanding Spontaneity*, consisted of three steps: the introductions of the communication board (pictures attached with velcro), and increase in the distance of the receiving trainer and Molly, and an increase in the distance of the board from Molly. Molly had 80% correct, independently requesting was the criterion. *Phase III, Discrimination of Pictures*, consisted of discrimination between multiple pictures on the
communication board, correspondence checks and picture size reduction. Phases I-III were taught to criterion in the home setting and then treatment was implemented in classroom settings (Kravits et. al, 2002).

All sessions consisted of both teaching and play periods. The PECS was taught during the teaching periods (5-10 trials, approximately 5 minutes) followed by the play periods (15-20 minutes), during which choices of items and activities was available. A total of 71 trials over five training periods was required to reach criterion for Phases I-III at home, 41 trials over eight sessions were required in centers, and 15 trials over five training sessions were required at journal time. Once criteria for the phases were reached, reinforcer assessment and a minimum of five training trials continued at the beginning of sessions; however, the time for training became shorter over time as Molly mastered initiations with PECS (Kravits et. al, 2002).

The findings of this study demonstrated that Molly increased her spontaneous language using icons during settings when the PECS treatment conditions were implemented and were consistent between home and school. There was an increase in initiations at home when materials from the reinforcer assessment and training were available during free play. Molly learned 38 icons and 4-8 icons were used during the 10 minutes intervention sessions. Intelligible verbalizations also showed an increase in two settings, home and journal time, with a range of 15-16 at home and 5-8 at school. At home, Molly averaged 8-9 initiations during play in baseline and 18 during PECS. During school centers, Molly averaged 3-5 initiations in baseline, with PECS an increase to 11 during the intervention. During journal time, she had 4-7 initiations in baseline and
14 during intervention. These findings indicate that increased spontaneous language included both increased verbalizations and icon use in two settings (Kravits et. al, 2002).

The t tests results indicated significantly more initiations ($df = 1, F = 114.9, p < .01$) and verbalizations ($df = 1, F = 30.1, p < .01$) during intervention sessions over baseline sessions. Observations also indicated that Molly did not significantly increase the range of spoken language during the intervention. For younger children, it has been reported that if verbal language begins, it generally occurs after approximately a year in the PECS program (Bondy, Hoffman, and & Glassberg, 1999).

The duration of social interaction with peers was also monitored to note treatment effects. There were few changes at home due to her brother being the only peer for her at home. However, at school, increases were noted during journal time. She increased the duration of social interactions with peers from 26-60 seconds to 146 seconds (Kravits et. al, 2002).

This study provided one example of the effectiveness of PECS in increasing spontaneous communication skills for a young child with autism. Future research with PECS should include a long-term study with three and four-year-olds entering into a program with the PECS intervention in place and take data on the spontaneous communication skills they learn from using the PECS (Kravits et. al, 2002).

Ganz & Simpson (2004) conducted a study to examine the role of PECS in improving the number of words spoken, increasing the complexity and length of phrases, and decreasing the non-word vocalizations of three young children with ASD and developmental delays (DD). Three students (one in preschool and two elementary age),
were identified by local school district personnel and parents as having little to no functional speech (i.e., zero to ten spoken words used in functional contexts). Each of the participants also met the following criteria: (a) no prior experience with the PECS or exposure to PECS, including observing other using PECS, (b) between the ages of three and seven-years-old, (c) preverbal or limited functional speech, and (d) in need of an Augmentative and alternative communication (AAC) system for this study.

Participant 1: Gail was an Asian female, 5 years and 8 months of age. She was identified as having severe autism. Gail attended a half-day general education kindergarten, could say about 10 words, and used limited immediate and delayed echolalia. She did not respond to her name, label items, follow one-step directions, or interact with peers (Ganz & Simpson, 2004).

Participant 2: Ramon was an African-American male, 7 years and 2 months of age identified as having Developmental Delays with autistic characteristics and speech language impairment. He attended a general education, first grade class, and received special education services and speech and language impairment services. Ramon could say over 30 words, but did not speak functionally while in the classroom (Ganz & Simpson, 2004).

Participant 3: Ben was a Caucasian male, 3 years and 9 months of age identified as having Developmental Delays and speech language impairment. He attended a half-day early childhood special education classroom with speech and language impairment services and social work services. Ben could say of 20 words, but inconsistently used them spontaneously and functionally. He frequently repeated questions instead of
answering them and needed several repetitions to follow directions (Ganz & Simpson, 2004).

This study was conducted in each of the participant’s schools, which were located in low socioeconomic neighborhoods in a large, urban school district. Prior to the PECS training, the parents, teachers, and paraprofessionals were asked to fill out a checklist of preferred reinforcements for each participant and were asked to provide a list of words each child had been observed to say. This study followed the procedures outlined by Frost and Bondy (1994) in the PECS training manual, which provides instructions for each training phase. Two to five PECS training sessions took place per week, for 15 trials per session, until participants’ mastered the first four phases of PECS. Mastery criteria was 80% of the trials performed independently for three consecutive 15 trial sessions, for each phase in accordance with the criteria outlined in the PECS training manual (Frost & Bondy, 1994). Each phase was continued for a minimum of five sessions, even if the child met mastery criteria in three sessions, to continue appropriate practice in each phase (Ganz & Simpson 2004).

The observers collected data on each participant’s proficiency relative to the PECS phase criteria, recording whether the child performed the desired response independently (score of 1) or with prompting (score of 0, any verbal, gestural, physical, or corrective assistance given to facilitate the exchange) for each trial. The communicative partner enticed the child with a preferred item(s) or the child would spontaneously take a picture out to make a request, make the exchange. The observer also recorded the number of intelligible words spoken and the presence (1 = yes, 0 = no) of nonword
vocalizations. Videotapes were observed to collect speech occurring during the trials (Ganz & Simpson, 2004).

The materials used in the PECS training included communication binders with strips of velcro. The binders had pages inserted with strips of velcro on both sides and a plastic sentence strip. Each participant had a minimum of 20 color line drawings and color photos from a camera. Each picture was stored in the participants’ communication binder (Ganz & Simpson, 2004).

Observer agreement was calculated using approximately 40% of all sessions of PECS training, with an overall mean inter-observer coefficient of agreement was calculated at 93% for Gail, 94% for Ramon, and 92% for Ben (Ganz & Simpson, 2004).

Gail demonstrated that she mastered the system in 29 sessions (447 trials). She demonstrated few words per trial in Phase 1, averaging 0.36 words (range = 0-0.93, \( SD = 0.29 \)). She spoke slightly more in Phase 2, on average, saying 0.65 words per trial (range = 0.27-1.73, \( SD = 0.61 \)). This dropped in Phase 3 to 0.13 words per trial (range = 0-0.40, \( SD = 0.12 \)). However, she showed a dramatic growth in Phase 4, by using an average of approximately three-word phrases in each trial (\( M = 2.70, range = 0.30-5.10, SD = 1.79 \)).

There was data recorded of trials in which non-word vocalizations occurred. The aggregate trend line shows a decrease, but the variability and means across the phases were not consistent (Phase 1: \( M = 44\% \) of trials, range = 13%-73%; Phase 2: \( M = 69\% \), range = 53%-80%; Phase 3: \( M = 26\% \), range = 0%-65%; Phase 4: \( M =35\% \), range = 6%-67%). Gail’s data displayed that while she had intelligible word utterances increase
throughout the PECS training, her nonword vocalizations did not decrease (Ganz & Simpson, 2004).

Ramon demonstrated mastery of PECS within 20 sessions (292 Trials). He showed little growth in average words per trial throughout the first two phases of PECS (Phase 1, $M = 0.04$, range = 0-0.2, $SD = 0.09$; Phase 2, $M = 0.14$, range = 0-0.36, $SD = 0.13$). He demonstrated increasing growth during Phase 3 ($M = 0.93$, range = 0.13-1.27, $SD = 0.56$) and Phase 4 ($M = 3.68$, range = 3.40-4.18, $SD = 0.32$). Ramon used one to two word utterances during the first three phases and began speaking more three to four word phrases in Phase 4. He demonstrated lower percentages of trials in which non-word vocalizations occurred than the other participants. He demonstrated high variability. Percentages of non-word vocalizations across the phases did not show significant change throughout the PECS training (Phase 1: $M = 15\%$ of trials, range = 0%-60%; Phase 2: $M = 5\%$, range = 0%-17%; Phase 3: $M = 3\%$, range = 0%-7%; Phase 4: $M = 13\%$, range = 0%-27%) (Ganz & Simpson, 2004).

Ben demonstrated that he mastered the system in 20 sessions (300) trials. He began browsing through his communication binder and choosing pictures for items he preferred before Phase 3. He was able to master the system with a variety of adults, including making spontaneous, unprompted picture request outside of the PECS training. Ben demonstrated a low average words per trials during the Phase 1 and 2 (Phase 1, $M = 0.64$, range = 0.27-0.87, $SD = 0.26$; Phase 2, $M = 0.25$, range = 0.13-0.53, $SD = 0.16$). He showed growth in Phases 3 and 4 (Phase 3, $M = 1.00$, range = 0.60-1.53, $SD = 0.48$; Phase 4, $M = 2.89$, range = 1.43-4.40, $SD = 1.05$). The data showed that Ben only used
one-word utterances during the first 3 phases. By Phase 4, he quickly learned to read back the complete sentence from the sentence strip. The trend line for Ben’s non-word vocalizations showed an increase. However, a visual inspection of data demonstrated great variability and the means across the phases were inconsistent, and did not show a clear pattern (Phase 1: $M = 8\%$ of trials, range = 0%-27%; Phase 2: $M = 8\%$, range = 0%-13%; Phase 3: $M = 24\%$, range 6%-33%; Phase 4: $M = 23\%$, range 0%-54%). The increase in unintelligible vocalizations could be attributed to Ben’s tendency to mumble, and many of the non-word vocalizations were word approximations (Ganz & Simpson, 2004).

This study indicated that, as a result of the PECS interventions, all three participants made progress in mastery of the PECS system and demonstrated some increases in average intelligible words spoken per trial. The participants showed generalizations of skills with a variety of adults. Overall, the participants mastered the PECS program rapidly and learned the system in an average of 23 sessions ($M = 346$ trials). By the end of the training, the participants were using high levels of words per trial compared to their number of words during Phase 1 (Ganz & Simpson, 2004).

*Discrete Trial Training.* This is the study of behavior and the manipulation of contingencies and setting events to increase or decrease specific behaviors. One small subset of this methodology is discrete trial therapy (DTT). Ivar Lovaas has researched methods of applied behavior analysis for over 30 years and is most recognized from a 1987 publication of a study he conducted with children with autism. Based upon his research, Lovaas concluded intensive behavioral intervention (including the use of
Discrete Trials) offered much hope for improving the outcomes of children with autism. Forty-seven percent of children ultimately gained normal functioning such that they were virtually indistinguishable from their peers (Lovaas, 1987). A follow-up study of these same children in 1993 concluded the results were sustained (McEachin, Smith, & Lovaas, 1993).

The discrete trial in DTT refers to the basic teaching unit delivered in one-to-one instruction. This instruction involves highly structured teacher direction in a trial-by-trial format, meaning that the child is instructed on a single skill a number of times during a single session, utilizing a series of prompts and rewards to shape behaviors (Scheuermann & Webber, 2002).

According to Choutka, Doloughty, and Zirkel (as cited in Green, 2000), DTT and ABA are synonymous for most parents and school officials, discrete trial is but one aspect of ABA. According to Anderson & Romanzyk (as cited in Green, 2000), with this type of instruction, the outcomes of seemingly small increments of learning are quantified and measured to ensure progress in many preacademic skill areas. DTT is a method for individualizing and simplifying instruction for children with ASD. It is useful when teaching new forms of behavior such as speech sounds or motor movements that a child previously could not make. DTT can teach children new discriminations such as responding correctly to different requests. However, there are reasons to be cautious about DTT. This method must be combined with other interventions to enable children to initiate the use of their skills and display these skills across settings. According to Smith (2001), each discrete trial has five parts as displayed in Table 3.
Table 3.

Discrete Trial Parts

<table>
<thead>
<tr>
<th>Part</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cue:</td>
<td>The teacher presents a brief clear instruction or question, such as <em>Do this</em> or <em>What is this.</em></td>
</tr>
<tr>
<td>Prompt:</td>
<td>At the same time as the cue, or immediately after it, the teacher assists the child in responding correctly to the cue, Example: The teacher may take the child’s hand and guide him or her to perform the response, or the teacher may model the response. As the child progresses, the teacher gradually fades out and ultimately eliminates the prompt so the child learns to respond to the cue alone.</td>
</tr>
<tr>
<td>Response:</td>
<td>The child gives a correct or incorrect answer to the teacher’s cue.</td>
</tr>
<tr>
<td>Consequence:</td>
<td>If the child gives a correct or incorrect response, the teacher immediately reinforces the response with praise, hugs, small bites of food, access to toys, or other activities the child enjoys, and if the child gives an incorrect response, the teacher says “No,” looks away, removes teaching materials, or otherwise signals that the response was incorrect.</td>
</tr>
<tr>
<td>Intertrial Interval:</td>
<td>After giving the consequence, the teacher pauses briefly (1-5 seconds) before presenting the cue for the next trial. (p. 2)</td>
</tr>
</tbody>
</table>
Early in DTT, children with ASD may require many hours of DTT, which is controversial regarding how much is appropriate. Educators need have specialized training to implement DTT effectively. Despite these limitations, DTT is one of the most important instructional methods for children with ASD (Smith, 2001).

Fortunately, investigators have conducted studies on how to accomplish teaching children with ASD and have identified a wide range of effective approaches (Green, 2000). Depending on the treatment program, children with ASD may receive anywhere from a few minutes to several hours a day of DTT. A child beginning DTT may have training several hours and then work to decrease the amount of time. There is research that exists on how to select responses to teach in DTT and how to best to cue, prompt, and reinforce these responses (Newsom, 1998). Some have reported that when DTT is applied as part of a comprehensive program, DTT can lead to long-term benefits for many children with autism (Smith, 1999).

Devlin and Harber (2004) conducted a study to assess the effectiveness of implementing a behavioral interventions consisting of intensive discrete trial training (DTT) being implemented by parents, special education teachers, a resource teacher, and a speech/language pathologist under the supervision of a trained applied behavior analysis specialist. The participant included a 5-year old Caucasian boy named William who was diagnosed with autism. The treatment agents consisted of the child’s parents, special education teacher, and speech/language pathologist.

Observations were recorded that were used to measure performance on given instructional objectives and assessed as to whether William could or could not perform
the appropriate response with or without prompting. There was ongoing assessment using curriculum based measurements in order to determine progress and results related to the instructional objectives. Teachers, therapists, and family members were trained to use the DTT to teach instructional objectives (Devlin and Harber, 2004).

The speech/language pathologist provided one-to-one language therapy using DTT, three times per week for one hour each day. The special education teacher used DTT to teach applicable skills in a special education classroom. The special education teacher also used visual supports, manipulatives, and offered opportunities to engage in center-based activities. The boys received extended school year services throughout the summer in order to maintain progress and eliminate possible regression (Devlin and Harber, 2004).

DTT occurred between 20 and 24 hours per week. Data was recorded and the parents, teachers, speech/language pathologist met weekly to compare data and communicate with the applied behavior analysis specialists. All DTT was in a highly structured one-to-one setting. As William mastered basic skills, discrete trials were moved into a natural environment to promote generalization and teach new skills (Devlin and Harber, 2004).

William, at 45 months had mastered three attending skills (sits in a chair independently, makes eye contact in response to name, makes eye contact when given an instruction Look at me), four imitation skills (gross motor movements, actions with objects, fine motor movements, oral motor movements), one receptive language skill (identifies familiar people), three expressive language skills (points to desired items in
response to *What do you want?*, points to desired items spontaneously, imitates sounds and words), and eight self-help skills (drinks from a cup, uses fork and spoon, removes shoes, removes socks, removes pants, removes shirt, uses napkin, is toilet-trained for urination) (Devlin and Harber, 2004).

In addition to the Beginning Curriculum Guide, William mastered items from the Intermediate Curriculum Guide: two attending skills (sustains eye contact for 5-seconds in response to name, makes eye contact in response to name while playing), three imitation skills (gross motor movements from a standing position, sequenced gross motor movements, sequenced actions with objects), three receptive language skills (identifies emotions, retrieves objects out of view, pretends), five pre-academic skills (copies letters' and numbers, draws simple pictures, writes name, pastes/glues, cuts with scissors) and two self-help skills (washes hands, is toilet trained for bowel movements. He also mastered one advanced imitation skills (imitates peer play) (Devlin and Harber, 2004).

Within 28 weeks of DTT, William demonstrated significant improvements. In addition to previously mastered items, he mastered the last attending skill (responses to the direction "No Hands."), all four imitation skills which were mastered at the initial assessment, seven more receptive language skills (follows one-step instructions, identifies body parts, identifies objects, identifies pictures, follows verb instructions, identifies objects in movements, points to pictures in a book), six more of the expressive language skills (labels objects, labels pictures, verbally requests desired items, states or gestures yes/no for preferred/nonpreferred items, labels familiar people, makes a choice), more pre-academic skills (matches identical objects, identical pictures, and colors,
completes simple activities independently, identifies colors, shapes, letters, and numbers), and maintained mastery in the previously mastered self-help skills (Devlin and Harber, 2004).

On level two curriculum objectives, William mastered two more attending skills (makes eye contact in response to name from a distance, asks what when name is called), two more imitation skills (imitates block patterns, copies simple drawings), two more receptive language skills (gives two objects, places sequence cards in order, seven more expressive language skills (imitates two-and three word phrases, requests desired items in response to What do you want?, uses simple sentences, describes pictures in a sentence, labels gender, role plays with puppets, offers assistance), two more pre-academic skills (matches uppercase to lowercase letters, completes simple worksheets), and now exhibits all of the self-help skills (puts on pants, shirt, coat, shoes, socks, and self-initiates for bathroom) (Devlin and Harber, 2004).

William also mastered more skills on the advanced curriculum objectives including one attending skill (makes eye contact during conversation), one more imitation skill (imitates verbal responses of peers), and one expressive language skill (retells a story). His mastery of desired Beginning Curriculum Guide skills improved from 31% to 69%. Desired Intermediate Curriculum Guide skills improved from 18% to 44%. This study indicated that DTT, collaboration, and extended school year provided opportunities to increase desired skills. The findings from this study suggest that a child with autism can obtain significant gains through the use of applied behavior analysis with the use of DTT between 20-24 hours per week across settings (Devlin and Harber, 2004).
Din and McLaughlin (2000) investigated whether applying the discrete trial approach is effective in teaching young children with autism to learn functional and pre-academic skills. The participants in the study were four Caucasian boys three-four years old with autism. They attended a preschool special education program in an urban public school. They joined the program at different times during a two year period.

**Chris:** He was four years old when he entered the program. He lived with his mother, who worked two jobs. Chris was diagnosed as having autism by his pediatric neurologist. He did not show eye contact with anyone, did not respond to anyone, and frequently closed his eyes. He could make speech sounds and repeat simple words (Din & McLaughlin, 2000).

**Isaac:** He was three years and nine months old when he attended the program. He lived with his parents who had a lower middle class income. He was diagnosed by a pediatric neurologist as having autism and PDD-NOS plus Attention Deficit Hyperactivity Disorder (ADHD). He had limited speech, but could repeat simple words and two or three-word sentences. He did not show eye contact when he was talked to and did not respond to anyone. He demonstrated repetitive behaviors and was running around all the time (Din & McLaughlin, 2000).

**Sam:** He was four years and two months when he attended the program. He lived with his parents who had a lower middle class income. He was diagnosed as having autism and PDD-NOS by his pediatrician. He had no speech but echolalia only. He was hyperactive. He would run around the classroom all the time. His attention span was
short and would hit the teacher or pull her hair when frustrated (Din & McLaughlin, 2000).

*Rodney:* He was three years and two months old when he attended the program. He lived with his parents who had a lower middle class income. He was diagnosed as having autism by his pediatrician. He had no eye contact, no speech, only babbling sounds. He preferred to be alone and looked into a mirror frequently (Din & McLaughlin, 2000).

Also participating in the study were one special education teacher and two teaching aides. The special education teacher trained them how to apply discrete trials and positive reinforcement to train the children with autism. The special education teacher received the assessment information for the children from their physicians; however each child was observed and assessed by the special education teacher. The purpose of the observations was to identify the priority skills each child need to be working for their IEP requirements and to determine each child’s preferences in terms of their likes and dislikes (called a reinforcer assessment). The reinforcer assessment was conducted on tangible items, activity reinforcers, social and sensory reinforcers, and areas of interest. This information was used to provide positive reinforcement during the discrete trials. This was an ongoing process to some extent. The baseline for the skills to be taught to each child in the program was zero. Based on the information gathered, an individualized training program was developed for each child (Din & McLaughlin, 2000).
At the beginning of each training session, the teacher or aide got the child’s attention first by talking to the child and moving their face to look at them. Next, she presented a verbal command or gave one task to the child and waited for their response. The teacher or aide gave a prompt if needed. When the child responds, the teacher gave a tangible reward or toy to play with for a brief moment. The teacher or aide recorded the child’s response on a Behavior Recording Sheet. Then the teacher took back the toy from the child and moved on to the trial. There were ten trials attempted for one task (Din & McLaughlin, 2000).

Each child received discrete trial training 40 to 60 minutes, four to five days per week. Each child had specific skill to learn, however each child was also taught to: follow directions, identify objects, body parts and action verbs, recognize functional vocabulary, and speak words and simple sentences (if child was able). There was computer software with touch-screen and sound features used each day with the child to reinforce skills taught during discrete trial. A chart was designed for the teacher or aide to record each response. The data was recorded immediately following each trial. A correct percentage was calculated for each attempted task. Daily records were kept for each child and the data was plotted on a progress chart (Din & McLaughlin, 2000).

The four boys participated in the discrete trial training for seven months to approximately one year. They learned various skills at or over (mostly over) the 85% mastery level. **Chris:** He received training from April to December. He learned to do the following: name objects (mastered in 5 days) and actions (mastered in 2-5 days), say action verbs (clapping, sleeping, jumping, crying, sneezing), say objects (blanket, dresser,
pillow, closet, kitchen knife, fork, napkin, toaster, sink, bubbles, cow, pig, mama), say (I want bubbles, -in one month), say See you later and I love you back-by end of training period) read simple words (by end of training period), follows directions (Look at me, Touch eyes, Give record, Sit down – in one month) (Stamp feet –in three days, Touch nose –in four days, Blow whistle – in two days) (Din & McLaughlin, 2000).

Isaac: He received his training for one year. He learned to do the following: follow one-step commands (Sit down, Look at me, Come here-in three months), two-step commands (Stand up, put eraser under table –in three days, Touch ears, clap hands –in two days), three-step commands (Touch nose, stand up, clap hands –in 11 days, Stand up, touch computer, come back –in three days and Touch knees, touch nose, stamp feet –in four days), name objects and actions (blanket, closet, dresser, pillow, and sliding –in 2-3 days and sliding, sleeping, eating, painting, riding bike, throwing ball, reading book, cutting, blowing balloon, and bouncing ball – in two to seven days), learn to tell texture (hard, soft, rough, and smooth – in three to four days), answer functional questions (Give me what you write with; Give me what you wash your hair with; Give me what you sleep in- in the same four day period), and answer Where is types of questions – in same three day period, and maintain eye contact in three months (Din & McLaughlin, 2000).

Sam: He received his training from October to July. He learned to do the following: follow directions (Look at me, Hand over PECS system of bus -in six days, Make back-and-forth motion with bus –in two days, Pop bubbles –in three days, Clap hands in three months, Sit down –in one month, Touch nose –in one month, and Come here –in six days, and Get boat –in six days), apply knowledge learned in school at home
—by the end of training period, and sat together with other peers —by the end of training period (Din & McLaughlin, 2000).

Rodney: He was only in the program from January to July. He learned to do the following: follow directions (Clap hands —in one month, Touch nose —in four months, Sit down —in one month, Use spoon independently to eat yogurt —in two months, Throw this away —in five days, Touch head —in four days, Get bus in two weeks, Get fire truck —in one month, and Touch bike —in five days), imitate (put block in container —in two months, Bang on drum —in six weeks and Stamp feet —in one month), and discriminate between baby doll and dinosaur —in one month (Din & McLaughlin, 2000).

The results of this study indicated that all four children with autism learned various functional and pre-academic skills through the discrete trial training approach. The approach seemed to be effective in teaching children with autism. The results showed that it took one child a few months to learn one skill, but only a few days to learn another. This study suggests that professionals should not expect a child with autism to learn a skill with a subjective time frame (Din & McLaughlin, 2000).

Physiologically Oriented Intervention Programs

In contrast to the relationship-based approaches that view learning and improvement possible only if the individual can emotionally affiliate with others and the skill-based programs that target and teach specific skills, the physiologically oriented intervention programs attempt to address the neurologic dysfunction that is believed to be at the core of autism spectrum disorders. The programs attempt to modulate how information is received in the brain, alter how the neurologic system processes
information, and/or affect behavioral output from the inside out. The emphasis is on changing the internal state of the individual, specifically his or her neurological functioning (Heflin & Simpson, 1998). There are seven interventions and treatment programs that are included in this category, Sensory Integration Therapy, Auditory Integration Training (AIT), Psychopharmacologic Treatments, Dietary Treatments, Rhythmic Entrainment Interventions, Iren Lenses, Vision Therapy. I felt that Sensory Integration Therapy was the most beneficial program in this category that I will discuss below.

Sensory integration therapy is based on a theory developed by Ayres (1972, 1979) that emphasizes the relation between sensory experiences and motor and behavioral performance. Organizations of our senses begin to function very early in life. The tactile, vestibular, and proprioceptive systems are closely connected to each other and form interconnections with other systems of the brain. According to Nancy Kaufman from the Kaufman Children’s Center for Speech, Language, and Sensory disorders, it is a complex act for a person to interpret a situation accurately and make an appropriate response. It is this organization of the senses for use that is termed sensory integration. When the process of sensory integration is disordered, a number of problems in learning, development, or behavior may become evident. Signs of dysfunction include: overly sensitive to touch, movement, sights, or sounds, under-reactive to sensory stimulation, activity level that is usually high or usually low, coordination problems, delays in speech, language, motor skills, or academic achievement, poor organization of behavior, and poor self concept (http://www.kidspeech.com, 2005).
Interventions consist of planned and controlled sensory experiences including, but not limited to, vestibular, proprioceptive, and somatosensory activities, such as swinging, deep pressure touch, and tactile stimulation. Activities are child-directed and emphasize product of the functional and adaptive responses to sensory stimuli (Dawson & Watling, 2000).

There is literature that suggests that, although sensory processing abnormalities are not universal or specific to autism, the prevalence of such in autism is relatively high (Dawson & Watling, 2000). Baranek, Foster, & Berkson (1997a) noted abnormal responses to sensory stimuli found in individuals with autism. Dawson and colleagues, in a case study of an infant with autism, reported that disturbances in sensory processing were apparent during the first year of life (Dawson, Osterling, Meltzoff, & Kuhl, 2000). Reports of both hypo- and hyper- responsiveness to sensory input raise the possibility that two groups of sensory responders may exist within the autism spectrum. Sensory processing abnormalities also have been found to be correlated with higher levels of stereotypic, rigid, and repetitive behaviors (Baranek, Foster, & Berkson, 1997b).

According to Case-Smith & Bryan’s study (as cited in Dawson & Watling, 2000) sensory integration therapy indicated positive outcomes in five children, ages 4-5 years old. This study had an AB design including baseline treatment. The children were videotaped and observed and viewed in random order. The intervention was implemented over a 10-week period. It consisted of a one-to-one (adult-child) therapy with a school consultant. The findings indicated that four children showed significant decrease in nonengaged behaviors. There was significant increase in goal-directed
behavior in three of the children. Also, one child showed significant increase in social interaction.

According to a study conducted by Linderman & Stewart (as cited in Dawson & Watling, 2000), two 3-year-old children demonstrated gains in social interaction and positive responses to their tactile system. This study also had an AB design including baseline treatment. The children were observed, and parents filled out a report. The intervention was implemented over an 11-week period for 1 hour of sensory integration therapy per day. Child A demonstrated significant gains in social interaction, approach to new activities, and response to holding and hugging. Child B demonstrated significant gains in social interaction and response to movement.

Ray, King, and Grandin (1998) examined the effect of vestibular stimulation (swinging) on speech sounds in children with autism. They found a 15% increase in vocalizations while the child was on a swing than in the absence of this vestibular stimulation.

Although sensory abnormalities are commonly found in children with ASD, the interventions designed to improve the abnormalities have not been well validated. Smith (1996) examined several investigations evaluating Sensory Integration (SI) effectiveness for children with developmental disorders and concluded that SI did not decrease self injury, did not reduce, ritualistic behaviors and did not show increases in motor development.

Sensory sensitivities virtually affect all aspects of academic, cognitive, adaptive, and social functioning. It is important to learn more about the effects of sensory
integration therapy for children with ASD. There is not enough research to identify which age group or subgroups of individuals are most likely to benefit from therapies addressing sensory difficulties (Dawson & Watling, 2000).

Effective Professional Development

As parents of children with ASD become more aware of recent research of interventions and treatment programs, they will ask public school teachers to incorporate these ideas into their classrooms (Jacobson, 2000). The demand for teachers who have expertise in applied behavior analysis and other interventions will grow as more young children with autism receive the majority of their education in preschool settings and regular public school. Enrollment of children with ASD and related disabilities in U.S. schools increased from 5,000 students in 1991-1992 to 94,000 in 2000-2001 (U.S Department of Education, 2002). Continuing education is necessary for teachers. Studies have shown that teachers and staff can learn to implement behavioral interventions for children with ASD and are provided a wide range of training materials that identifies best practice for training others (Gravois, Knotek, & Babinski, 2002; Noell, Duhon, Gatti, & Connell, 2002; Lerman, Vorndran, Addison, & Kuhn, 2004).

Lerman et. al (2004) reported the outcomes of a model program that was designed to prepare current teachers in evidence-based practices for children with ASD. It was conducted during several weeks in the summer as part of a university-based early intervention program. The main purposes of the study were to evaluate whether teachers (a) could learn multiple strategies in a limited amount of time, (b) would acquire certain skills more quickly than other skills, and (c) would show a preference for using certain
prompting strategies over other strategies when they were free to select among several different strategies.

Four certified teachers who taught children with ASD and other DD and one student teacher participated in the study. Six children enrolled in an early intervention summer program also participated in the program. The children were ages 3-6 and had been diagnosed with autism. Four of the children had no communication skills. All but 2 children had some imitation skills and followed one-step directions. All of the children engaged in one or more behaviors, including self-injury, aggression, noncompliance, and disruption (Lerman et. al, 2004).

The teachers attended a 1-week workshop from 8:30 a.m. to 12 p.m. for consecutive days. The teachers were taught specific skills within three areas (preference assessment, direct teaching, and incidental teaching). Approximately one week after the conclusion of the workshop, each teacher was paired with a child who was attending the summer program and was asked to demonstrate each of the targeted skills. The observations occurred approximately three times per week.

During baseline role-play for preference assessments, the teachers generally implemented less than 65% of the steps correctly, with a few exceptions. However, all of the teachers implemented each type of preference assessment with perfect or near-perfect accuracy during the three role-play sessions. The teachers maintained their skills during the 6-week summer program when the teacher was paired up with a student in the program. The teachers generally implemented less than 50% of the steps correctly for the discrete trial techniques during the baseline role-play. By the third or fourth
postinstruction role-play session, the teachers met or exceeded the accuracy criterion for each discrete teaching technique. The teachers continued to implement the direct teaching technique with 80% or greater accuracy during the summer program. Data was collapsed across the first three 10-min sessions and the last three 10-min sessions to evaluate possible improvements in the child’s behavior as a result of exposure to incidental teaching. One of the children showed improvement (Lerman et. al, 2004).

The teachers participating in this study mastered multiple skills in a limited amount of time. The results indicated that multiple strategies within each skill (such as different prompting methods) should be taught to teachers. There is a need for follow-up observations of the teachers in their own classrooms to provide a more thorough evaluation of skill maintenance, generalization, and preference for different techniques. Periodic monitoring and feedback would probably be necessary for teachers to maintain skills (Noell et al., 2002).

Prince Edward Island is the smallest providence in Canada with a population of 139,900. They follow an inclusionary model, have no segregated schools, and most students are educated in their neighborhood school. The Department of Education in Prince Edward Island (PEI) has identified a significant number of students diagnosed with PDD-NOS, Autistic Disorder, and Asperger's Disorder. Teachers, parents, and administrators in PEI have expressed concerns about the need to provide staff the training and support necessary to effectively educate children with ASD in their community schools (Timmons & Breitenbach, 2004).
PEI has committed to the development and implementation of a training model to provide support and recruitment of experienced teachers to be trained as autism lead teachers. In 2001, the Department of Education created a position for an autism consultant to provide direction and coordination of service for children with ASD. This consultant provided training and individual school consults during the first year. They discovered that one person could not provide the necessary support. In 2002, three teachers were selected as autism lead teachers to provide support to other teachers, teacher assistants, and families. In 2003, three more teachers were selected to the autism lead teacher committee. This process resulted in the significant increase in the ability of our schools to educate students with ASD more effectively (Timmons & Breitenbach, 2004).

The professional development sessions are designed to provide educators with formal instruction in interventions and treatment programs. Evidence shows there is a demand for teachers to be more knowledgeable or considered experts about how to teach children with ASD (Jacobson, 2000). Research cited above demonstrates that teachers can learn to implement interventions and treatment programs successfully through professional development sessions. The professional development sessions designed in this project give Dubuque’s special education teachers and paraprofessionals, support staff, and administrators an opportunity to receive this knowledge. Through the professional development sessions the educators will learn numerous strategies during 4 two-hour sessions during the school year. There will be informal discussions to provide feedback and question/answer opportunities for teachers to maintain skills.
CHAPTER III

INTERVENTIONS AND TREATMENT PROGRAMS PROJECT FOR CHILDREN WITH ASD

Currently within my school district, our special education teachers are using bits and pieces of different interventions and treatment programs to teach students with severe ASD, with minimal training. Not all special education teachers, within the district, are using the same approaches even within the same intervention or treatment program. There is a wide variety of interventions and treatment programs available for educators to use in their classrooms, so the difficult task is determining which one(s) are most beneficial for children with severe ASD. My concern of how to determine which interventions and treatment programs to use with this special population led me to design professional development sessions to provide educators with important information on ASD, and implementation of interventions and treatment programs.

I have designed four two-hour professional development sessions to provide educators with knowledge about ASD and interventions and treatment programs. The sessions include detailed descriptions of specific interventions and treatment programs that would be more beneficial for children with severe ASD. The participants will be actively involved in learning about these through role-playing, small group, and large group activities. The sessions will allow participants to ask questions regarding the information provided. They will be given time between session dates to implement the interventions or treatment programs within their classrooms and practice how to assess the child's progress.
Early childhood teachers and paraprofessionals, support staff, and administrators from Jones Early Childhood Center in Dubuque, Iowa will be invited to participate in these professional development sessions. Prior to the beginning of the school year, I will meet with the Early Childhood Advisory Committee to present my project and stress the need for more professional development regarding children with severe ASD.

The committee and I will arrange a meeting with our administrator and department head of curriculum for early childhood. At this meeting, the group will hopefully make the decision to include this project and assign the sessions to the calendar. During the week of August 21st, a professional development opportunity handout (see Figure 1) will be distributed in the invited participants' mailboxes. On September 11th, using the professional development opportunity handout (see Figure 1) during a scheduled staff meeting, a brief presentation will serve as a reminder to those who have not signed up yet. The invited participants will respond by phone or email to me by September 15th.

The sessions will likely be scheduled on early dismissal days and held during the months of October, December, February, and April. After each session the participants will be given assignments to implement with their students with ASD and asked to return data sheets at the following professional development session. Informal discussions will be planned on the 15th of November, January, March, and May at 3:15 p.m. in my classroom to discuss questions about the implementation of the intervention or treatment program the participants were asked to implement. The informal discussions will also give participants opportunities to share ideas and learn new ideas.
Professional Development Opportunity

**Who:** Early childhood special education teachers, paraprofessionals, support staff, and administrators

**When:** Four 2-hour professional development sessions:

- **Session #1:** Overview of Autism, Interventions based on formation of interpersonal relationships (Floor Time)
- **Session #2:** Skill-Based interventions and treatment programs (Picture Exchange Communication System)
- **Session #3:** Skill-Based interventions and treatment programs (Discrete Trial Training)
- **Session #4:** Physiologically oriented interventions and treatment programs (Sensory Integration therapy)

Come join the exciting opportunity to learn about interventions and treatment programs that can be implemented into your classrooms! There will be a brief description about each one, role-playing, modeling, small and large group activities, and always time for questions!

Please contact Michelle Leicht to reserve your spot by September 15th (563) 552-5850 or Email mleicht@dubuque.k12.ia.us

**Coffee, juice, and a small snack will be provided at each session**

*Overview of Autism, Formations of Interpersonal Relationships (Session 1)*
The first professional development session will begin with a True/False quiz regarding different interventions and treatment programs (see Figure 2).

An overview of each of the four sessions will be presented. The agenda for Session 1 will be presented on a power point slide (see Figure 3). The goals and objectives of this session are: (a) To provide the participant’s knowledge about ASD and interventions and treatment programs, (b) To assist participants to learn how to implement Floor Time, and (c) To explore benefits or disadvantages of Floor Time will be presented on a power point slide.

This session will enhance the participants’ knowledge of ASD and explore the category, Formation of Interpersonal Relationships. Included is a more extensive discussion on the Floor Time intervention for teaching children with ASD. A power point presentation will provide an overview of facts about ASD, the theories of causes, characteristics or symptoms, the different diagnoses and the floor time intervention (See Appendix B). The participants will be asked to discuss with a partner: (a) What they feel autism is, (b) What causes autism, and (c) Write down five characteristics of children with ASD that they have observed in the classroom.

The participants will then receive a handout discussing the six developmental milestones and the five-steps to Floor Time according to Greenspan (see Appendix B for all participant handouts). These handouts will guide staff as they break into groups of two and role-play a scenario using the floor time intervention. Each group will receive
## Quiz: HOW MUCH DO YOU KNOW ABOUT INTERVENTIONS AND TREATMENT PROGRAMS FOR CHILDREN WITH ASD?

Directions: Please circle T if the statement is True or F is the statement is False.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>ASD stands for Autism System Disorder.</td>
<td>T  F</td>
</tr>
<tr>
<td>2.</td>
<td>Autism is four more times prevalent in boys than girls.</td>
<td>T  F</td>
</tr>
<tr>
<td>3.</td>
<td>It is estimated to occur in as many as 1 in 66 individuals.</td>
<td>T  F</td>
</tr>
<tr>
<td>4.</td>
<td>Autism is caused by only drug and alcohol abuse.</td>
<td>T  F</td>
</tr>
<tr>
<td>5.</td>
<td>A child with autism most likely lacks eye contact with others.</td>
<td>T  F</td>
</tr>
<tr>
<td>6.</td>
<td>There are five diagnosis of autism.</td>
<td>T  F</td>
</tr>
<tr>
<td>7.</td>
<td>There are interventions and treatment programs that stress the importance of developing empathy and the ability to express their attachments to others in a typical fashion.</td>
<td>T  F</td>
</tr>
<tr>
<td>8.</td>
<td>Floor Time was developed by Andrew Bondy.</td>
<td>T  F</td>
</tr>
<tr>
<td>9.</td>
<td>ABA stands for Applied Behavior Analysis.</td>
<td>T  F</td>
</tr>
<tr>
<td>10.</td>
<td>PECS teaches children to initiate communication by exchanging a single picture for a desired item.</td>
<td>T  F</td>
</tr>
<tr>
<td>11.</td>
<td>Discrete Trial Training is taught with a small group of children.</td>
<td>T  F</td>
</tr>
<tr>
<td>12.</td>
<td>Each discrete has five parts.</td>
<td>T  F</td>
</tr>
<tr>
<td>13.</td>
<td>A child with autism may not like to be touched or hugged.</td>
<td>T  F</td>
</tr>
<tr>
<td>14.</td>
<td>Children with autism have typically speech and language skills.</td>
<td>T  F</td>
</tr>
</tbody>
</table>
one scenario to discuss and role-play. For example, a child is playing in the kitchen center and says he or she is hungry. The teacher can open the toy refrigerator and offer some food, pretend to cook, or ask if he or she will go to the pretend market with you to get things to eat. At the end of the session, each participant will have a complete list of the scenarios to help guide them as they return to their classrooms to use them with their children with ASD.

Figure 3

Session 1 Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:30 p.m.</td>
<td>Welcome, Quiz: How much do you know about interventions and treatment programs for children with ASD?</td>
</tr>
<tr>
<td>1:45 p.m.</td>
<td>Review Goals and Objectives</td>
</tr>
<tr>
<td>1:55 p.m.</td>
<td>ASD and interventions and treatment programs presentation</td>
</tr>
<tr>
<td>2:30 p.m.</td>
<td>Formation of Interpersonal Relationships</td>
</tr>
<tr>
<td></td>
<td><em>Floor Time</em></td>
</tr>
<tr>
<td>2:50 p.m.</td>
<td>Small group (review role-playing scenarios)</td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td>Present scenarios to large group</td>
</tr>
<tr>
<td>3:20 p.m.</td>
<td>Closing remarks and answer questions</td>
</tr>
</tbody>
</table>

Next, we will return to the large group and the participants will have an opportunity to share their scenario and ask questions. Finally, there will be brief closing remarks to remind participants of the time, date, and content of session 2. The participants will be encouraged to try the floor time strategies with their students. The participants will need to record at least five scenarios they used with students in the classroom. An informal meeting after school on Monday, November 15th will be
scheduled to discuss how the strategies are working/not working and give an opportunity to ask questions.

*Skill-based interventions and treatment programs including PECS (Session 2)*

Figure 4

Session 2 Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:30 p.m.</td>
<td>Welcome, Review informal discussion from November 15th</td>
</tr>
<tr>
<td>1:40 p.m.</td>
<td>Review Goals and Objectives</td>
</tr>
<tr>
<td>1:45 p.m.</td>
<td>Skill-Based interventions and treatment programs</td>
</tr>
<tr>
<td></td>
<td><em>Picture Exchange Communication System (PECS)</em></td>
</tr>
<tr>
<td>2:30 p.m.</td>
<td>Small group discussions</td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td>Large group sharing</td>
</tr>
<tr>
<td>3:20 p.m.</td>
<td>Closing remarks and answer questions</td>
</tr>
</tbody>
</table>

The second professional development session (see Figure 4) will begin with a review of the informal discussion on November 15th about Floor Time. Questions or requests for clarification will be answered at this time. The goals and objectives of this session include: (a) To provide the participant’s knowledge about skill-based interventions and treatment programs, (b) To assist participants to learn how to implement PECS, and (c) The session topic will center on skill-based interventions and treatment programs. More specifically, they will learn about the PECS training. A power point presentation (see Appendix C) has been developed that includes information about skill-based interventions and treatment programs, specifically focused upon information about PECS. The participants will discuss with a partner how they think PECS could be used in the classroom. The presenter will use volunteers from the
audience to role-play examples of Phases One-Five of PECS. Next, the participants will break into their teams (teachers and their paraprofessional); support staff and administrators will need to join a group.

Small group discussions on the following four items (a) Which students in your classroom could benefit from PECS, (b) Pick at least one student to begin using PECS with, (c) How are you going to start PECS, and (d) What materials will you need, will occur among participants. Finally, there will be brief closing remarks to remind participants of the time, date, and content of session 3. The participants will implement PECS with at least one student in their classroom following this session. The participants will use the information discussed in their small groups to assist with the implementation of PECS for their homework assignment. They will need to follow the phases developed by Bondy & Frost and record their data on sheet provided (see Appendix C). There will be an informal meeting after school on January 15th at 3:15 p.m. in my classroom to discuss how PECS is working/not working and give participants an opportunity to ask questions.

*Skill-based interventions and treatment programs including DTT (Session 3)*

The third professional development session (see Figure 5) will begin with a review of the January 15th informal discussion on PECS and responses to requests for questions. The goals and objectives of this session include: (a) To provide the participants information about DTT, (b) To assist participants to learn how to implement DTT, and (c) To explore benefits or disadvantages of DTT will be presented on a power
point slide. This session will provide the participants with knowledge about DTT through a power point presentation (see Appendix D).

Figure 5

Session 3 Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:30 p.m.</td>
<td>Welcome, Review January 15th informal discussions</td>
</tr>
<tr>
<td>1:40 p.m.</td>
<td>Review Goals and Objectives</td>
</tr>
</tbody>
</table>
| 1:45 p.m. | Skill-Based interventions and treatment programs  
|           | Discrete Trial Training (DTT)   |
| 2:45 p.m. | Small group discussions        |
| 3:00 p.m. | Large group sharing            |
| 3:20 p.m. | Closing remarks and questions  |

The participants will discuss with a partner if they have implemented DTT in the past or ever observed the training. The participants will be asked to raise their hand if they had done DTT or raise their hand if they had ever observed DTT. In the large group setting, volunteers will give examples of DTT by role-playing different types of instructions such as *Do this, Give me, Point to car, Touch nose, Find same, Put in.* Following the examples, a demonstration of how to record the data will be given. The participants will refer to the data sheets provided.

Next, the participants will break into groups of three. They will be instructed to role-play a DTT and record data on the example data sheets and answer the following two questions (1) What other skills could be taught through DTT and (2) Pick a child in your classroom can you set up a DTT, what instruction would you give? The participants will gather in the large group and have the opportunity to ask questions about the DTT
and share their DTT set up for a child in their classroom. Finally, there will be brief closing remarks to remind participants of the time, date, and content of Session 4. By the next session, the participants will need to implement a DTT with a child and record the data on the sheets provided (see Appendix D). An informal meeting after school on March 15th at 3:15 p.m. in my classroom will be scheduled to discuss how the discrete trials are working/not working and give an opportunity to ask questions.

*Physiologically Oriented Interventions and treatment programs including Sensory Integration Therapy (Session 4)*

Figure 6

Session 4 Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:30 p.m.</td>
<td>Welcome, Review informal discussion on March 15th, Quiz: How much do you know about interventions and treatment programs for children with ASD?</td>
</tr>
<tr>
<td>1:45 p.m.</td>
<td>Review Goals and Objectives</td>
</tr>
<tr>
<td>1:50 p.m.</td>
<td>Physiologically oriented interventions and treatment programs</td>
</tr>
<tr>
<td></td>
<td>Sensory Integration Therapy (SI)</td>
</tr>
<tr>
<td>2:40 p.m.</td>
<td>Small group (manipulating items)</td>
</tr>
<tr>
<td>2:55 p.m.</td>
<td>Overview</td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td>Questions</td>
</tr>
<tr>
<td>3:15 p.m.</td>
<td>Presenter evaluation</td>
</tr>
</tbody>
</table>

The final professional development session will begin with a re-take of the Quiz regarding different interventions and treatment programs. Next, the participants will be informed of the March 15th informal discussion and more questions can be answered at this time. The goals and objectives of this session include: (a) To provide the participant’s knowledge about physiologically oriented interventions and treatment (b)
To learn about Sensory Integration Therapy (SI) (c) To learn how to implement SI into their classrooms will be presented on a power point slide.

The topic of this session is physiologically oriented interventions and treatment programs. More specifically, they will learn about Sensory Integration Therapy (see Figure 6). A power point presentation will center on an overview of physiologically oriented interventions and treatment programs, along with a more extensive discussion on SI. A variety of materials will be used to demonstrate different techniques within SI, such as the brushing technique, the Ready Approach, and heavy work activities. The brushing technique must be taught by an occupational therapist specially trained in SI. The participants will be able to look at a sample brush and observe how it feels against their skin.

Next, the participants will divide into groups of three and be given time to manipulate the materials discussed. The participants will be asked to use two strategies with a child with ASD during the remaining school year. The participants will attend an informal meeting on May 15th at 3:15 p.m. in my classroom to learn the brush technique that will be taught to us by our occupation therapists. Participants will be given time to discuss how the SI strategies are working/not working and ask questions.

As an overview, the participants will be asked to write down three things they learned throughout the four sessions that will benefit children with ASD in their classrooms. Next, each participant will share one answer with the large group. A short time will be available for participants to ask final questions. Finally, the participants will
be asked to fill out a presenter evaluation sheet (see Appendix E) to provide feedback about the professional development sessions.
CHAPTER IV

CONCLUSION AND RECOMMENDATIONS

The design of this project began with the following questions: (1) What interventions and treatment program for children with severe autism are available to use in an educational setting, (2) What research supports interventions and treatment programs for children with severe autism, (3) How can they be implemented into the classroom, and (4) How can professional development sessions be implemented to assist teachers?

As a special education teacher, I previously have used some of the interventions and treatment programs described, adapted instruction from some of them, and used some without even knowing it. I learned from attending previous professional development sessions, talking with colleagues and Area Education Agency (AEA) staff, and searching the Internet that there are a wide variety of interventions and treatment programs available for children with severe ASD. I reviewed research that provided me with a better understanding and background knowledge of interventions and treatment programs that I was implementing in my classroom. This project gave me an opportunity to learn about interventions and treatment programs that I was not familiar with, but could be beneficial in my classroom.

My main purpose for designing these professional development sessions is to inform my colleagues about interventions and treatment programs that benefit children with ASD. The participants should receive the knowledge to implement these interventions and treatment programs in their classrooms and understand the importance
of their use when teaching children with ASD. This project reviewed evidence-based research that supports these interventions and treatment programs. Children with ASD have shown success when implementing these interventions and treatment programs in an educational setting. Educators need to know that research supports a number of approaches and that the goal is to tailor services to a child’s unique set of needs (http://www.floortime.org).

Recommendations

Through the professional development sessions, the participants will have learned interventions and treatment programs for a wide range of children with ASD. First, I recommend that the participants continue to use these strategies for children with ASD and refer to handouts given during the sessions. It is important to continue to look at each individual child’s needs and tailor interventions and treatment programs to meet those needs.

A second recommendation is a need for more resources in the area of ASD for teachers, paraprofessionals, support staff, and administrators to use throughout the school year. A research handout (see Appendix E) that I developed for this project will assist participants in locating additional materials such as books, journals, and Internet sites. Participants can also be referred to our AEA resource library where they can view a copy of the professional development sessions, books, and journals related to ASD.
A third recommendation is to make resources available at my own early childhood center. PECS symbols and examples and DTT ideas will be accumulated in master binders in our resource library for everyone to use.

Finally, information about ASD and specific interests should be included in our yearly professional development sessions planned by my district. The four professional development sessions that I developed in this project is only a beginning step in preparing teachers to implement interventions and treatment programs available for children with ASD in educational settings. My intention is to design more professional development sessions that will provide additional information.
REFERENCES


Floor Time Foundation, www.floortime.org, 6/25/06.


Kaufman Children's Center for Speech, Language, and Sensory disorders


APPENDIX A

GLOSSARY: DEFINITION OF TERMS
GLOSSARY: DEFINITIONS OF TERMS

Asperger's Disorder: An individual tends to have average or above average intelligence and typical or advanced language skills, obsessive interest in specific topic and memorize facts relating to topic, no show of empathy, little or no interest in playing with other children, inability to engage in two-way conversation.

Autism: A condition marked by developmental delay in social skills, language, and behavior, can present itself in varying degrees of severity.

Autistic Disorder: An individual tends to have a wide range of deficiencies in moderate to severe communication skills, social skills, and behavior problems, some may also have mental retardation, do not engage in play, prefer to put toys in mouth, line them up, or focus on parts of toys.

Autism Spectrum Disorders (ASD): Encompasses the following five disorders as defined in DSM-IV-TR: Autistic Disorder, Asperger's Disorder, Childhood Disintegrative Disorder, Rett's Disorder, and Pervasive Developmental Disorder-Not Otherwise Specified.

Childhood Autism Rating Scale (CARS): A test developed at Treatment and Education of Autistic and Related Communication Handicapped Children (TEACCH) to diagnose autism, the child is rated in fifteen areas of ability, resulting in assessment of nonautistic, autistic, or severely autistic.
Childhood Disintegrative Disorder (CDD): A rare form of pervasive developmental disorder in which normally developing children suddenly lose language and social skills after age three.

Developmental Disabilities: An impairment which occurs before the age of eighteen months and is expected to persist indefinitely, this includes pervasive developmental disorders, cerebral palsy, and mental retardation.

Echolalia: A condition in which an individual repeats words or phrases previously heard, delayed echolalia can occur days or weeks after initially hearing the word or phrase.

Extended School Year (ESY): Educational services especially crafted to students who need them beyond the regular school year, not to be confused with summer school or year-round school.

High functioning: Not officially recognized as a diagnostic category, it refers to individuals with ASD who have near-average to above average cognitive abilities and can communicate through receptive and expressive language.

Individual Educational Plan (IEP): The written yearly plan for school-age children ages three-twenty-one that specifies the services that the local education agency has agreed to provide children with disabilities who are eligible under IDEA.

Intervention: Action taken to attain and individual’s developmental potential, and is used synonymously with Treatment.
Low Functioning: Not officially recognized as a diagnostic category, it refers to individuals with ASD who have low and low-average cognitive abilities.

Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS):
Diagnosis which means a child shows some but not all of the criteria for Autistic Disorder, Asperger's Disorder, Rett's Disorder or CDD.

Pitocin: Labor-inducing drug.

Proprioceptive System: System that informs us of the position of our body parts.

Rett’s Disorder: Features reduced head growth and usually profound cognitive delays such as lack of communication skills, loss of purposeful hand skills, stereotyped hand movements, difficulty walking and poor coordination, slower head and body growth, sleep disturbances, seizures, and difficulty breathing.

Tactile System: System pertaining to the sense of touch on the skin.

Treatment Program: Action taken to attain an individual's developmental potential, and is used synonymously with Intervention.

Vestibular System: System pertaining to the sensory system located in the inner ear that governs posture and balance.
APPENDIX B

SESSION 1: PARTICIPANT HANDOUTS
SESSION 1 AGENDA

1:30 p.m. – Welcome, Quiz: How much do you know about interventions and treatment programs for children with ASD?

1:45 p.m. – Review Goals and Objectives

1:55 p.m. – ASD and interventions and treatment programs presentation

2:30 p.m. – Formation of interpersonal relationships

Floor Time

2:50 p.m. – Small group (review role-playing scenarios)

3:00 p.m. – Present scenarios to large group

3:20 p.m. - Closing remarks and questions
GOALS AND OBJECTIVES

Session 1

Goal 1: To provide the participant's knowledge about ASD and interventions and treatment programs.

a) Teachers will view information about ASD and interventions and treatment programs.

b) Teachers will learn about formations of interpersonal relationships, specifically the floor time intervention and the five-step process.

c) Teachers will learn about the six developmental milestones.

d) Teachers examine role-playing scenarios with a partner.

Goal 2: To allow participants to implement floor time.

a) Teachers will evaluate children with ASD to determine which student(s) could benefit from floor time.

b) Teachers will implement floor time with the determined students in their classroom.

Goal 3: To explore benefits or disadvantages of floor time.

a) Teachers will discuss the implementation process and the overall student performance.
Interventions and Treatment Programs for Children with Severe Autism in an Educational Setting

Presented by: Michelle Leicht
Fall 2006

Professional Development Session Schedule

- Four 2-hour sessions
- Beginning / End Quiz
- Small group / Large group
- Role-playing
- Ask / Answer Questions
Slide 3

Session #1

• Overview of Autism

• Programs based on Formation of Interpersonal Relationships (Floor Time)

Slide 4

Session #2

• Skill-Based interventions and treatment programs

(Picture Exchange Communication System - PECS)

Slide 5

Session #3

• Cont’ Skill-Based interventions and treatment programs

(Discrete Trial Training - DTT)
Session #4

- Physiologically Oriented Interventions and treatment programs
  (Sensory Integration Therapy)

Session #1 Schedule

1:30 p.m. - Welcome, Quiz
1:45 p.m. - Review Objectives
1:50 p.m. - Overview of Autism
2:30 p.m. - Formation of interpersonal relationships
             Floor Time
2:50 p.m. - Small group (scenarios)
3:00 p.m. - Present to large group
3:20 p.m. - Closing remarks, Questions

Session 1 Goals

Objectives

- Session #1:
  - Goal 1: To provide the participant with knowledge about ASD and interventions and treatment programs.
  - Teachers will learn about ASD and interventions and treatment programs.
  - Teachers will learn about the floor time intervention, specifically the floor time intervention and the floor type.
  - Teachers will learn about the six developmental milestones.
  - Teachers will examine role-playing scenarios with a partner.
Session 1 Goals and Objectives

- Goal 2: To allow participants to implement floor time.
- Teachers will evaluate children with ASD to determine which students could benefit from floor time.
- Teachers will implement floor time with the determined students in their classroom.
- Goal 3: To explore benefits or disadvantages of floor time.

What is Autism?

- Take 2 minutes to discuss with a partner what you think autism is.
- Let’s hear your ideas!

Autism is...

- Complex developmental disability that typically appears during the first 3 years of life
- Result of neurological disorder that affects the brain
- Estimated to occur in as many as 1 in 66 individuals

(www.autismquest.com)
Autism Facts

• Four more times prevalent in boys than girls
• Knows not racial, ethnic, or social boundaries
• Family income, lifestyle, and educational levels do not affect the chance of autism's occurrence

(http://autismspektrum.org/autism.html)

What do you think causes Autism?

• Take 3 minutes to discuss with a partner what you think causes autism
• Let's hear your ideas!

Causes for Autism

• Brain
• Genetics
• Environmental
• Immune system
• Immunizations
• Pregnancy

(Tolman & Hasker, 2005)
Early Signs of Autism
- No smiles or joyful expressions by 6 months or thereafter
- No back-and-forth sharing of sounds, smiles, or other facial expressions by 9 months or thereafter
- No babbling by 12 months (Exie & Voba', 2005)

More Early Signs
- No back-and-forth gestures, such as pointing, showing, reaching, or waving by 12 months
- No words by 16 months
- No two-word meaningful phrases (without imitating or repeating) by 24 months
- Any loss of speech or babbling or social skills at any age (Exie & Voba', 2005)

Characteristics of children with autism
- Write down 5 characteristics of children with autism that you observe in your classroom or another classroom.
A child with autism may...

- Prefer to play alone
- Lack eye contact
- Oblivious to everyone’s feelings
- Display ritualistic behaviors (lining up toys, opening/closing doors, turning on/off light switch)
- May not like to be touched, hugged, etc.

(Pashorne & Wolf, 2005)

A child with autism may...

- Have little or no speech
- Demonstrate endless repeating of cartoons, echoing or repeating words or phrases
- May have atypical behaviors (rocking, twirling, always carrying a small item or toy)

(Pashorne & Wolf, 2005)

The Word "Autism"

- According to The Autism Sourcebook (2005), the word "autism" is the catch-all term that many people use when referring to the spectrum of autistic disorders. The more current term for autism is autism spectrum disorders (ASD).
**Autistic Disorder**

- Individual tends to have a wide range of deficiencies in moderate to severe communication skills, social skills, and behavior problems
- Some may have mental disabilities
- Do not engage in play, prefer to put toys in mouth, line them up, or focus on parts of the toys

(Esther & Volker, 2005)

**Asperger's Disorder**

- Individual tends to have average or above intelligence and typical or advanced language skills
- Obsessive interest in specific topics and memorizes facts relating to topic
- Shows no empathy and little to no interest in playing with other children
- Inability to engage in two-way conversation

(Esther & Volker, 2005)

**Childhood Disintegrative Disorder (CDD)**

- Rare form of pervasive development disorder in which normally developing children suddenly lose language and social skills after age three.

(Esther & Volker, 2005)
Autism Spectrum Disorders

- There are five diagnoses:
  - Autistic Disorder
  - Asperger's Disorder
  - Childhood Disintegrative Disorder (CDD)
  - Rett's Disorder
  - Pervasive Development Disorder - Not Otherwise Specified (PDD - NOS)

(Eldevic & Vibskov, 2003)

Rett's Disorder

- Features reduced head growth and usually profound cognitive delays such as lack of communication skills
- Loss of purposeful hand skills and stereotyped hand movements
- Difficulty walking and poor coordination
- Slower head and body growth
- Sleep disturbances, seizures, and difficulty breathing

(Eldevic & Vibskov, 2003)

Pervasive Developmental Disorder - Not Otherwise Specified (PDD - NOS)

- Diagnosis which means a child shows some but not all of the criteria for Autistic Disorder, Asperger's Disorder, Rett's Disorder or CDD

(Eldevic & Vibskov, 2003)
Autism Spectrum Disorders

- Range from mild to severe
- With such a range of abilities the most effective way to educate children with mild to severe is to implement appropriate interventions or treatment programs for each child.

(From & Wheeler, 1997)

According to the Autism Society of America (ASA),

"Evidence shows that early intervention results in dramatically positive outcomes for young children with autism."

Interventions and Treatment Programs

Summarized into four categories by Heflin and Simpson (1998):
- Formation of Interpersonal Relationships
- Skill-Based Programs
- Physiologically Oriented Intervention Programs
- Combined Programs
Formation of Interpersonal Relationships
- Emphasizes social-affective differences as primary to cognitive and language deficits
- Stresses the importance of developing empathy and ability to express their attachments to others in a typical fashion
(Heflin & Simpson, 1998)

Interventions & Treatment Programs
- Holding Therapy
- Gentle Therapy
- Options
- Floor Time
(Heflin & Simpson, 1998)

Floor Time
- Developed by Stanley I. Greenspan
- His view of autism is thoroughly developmental
- He faults most interventions for zeroing in on the initial problem observed - rather than conceiving the child’s challenge in terms of broad developmental processes across all areas
(www.floortime.org)
Floor Time Approach

- Warm and intimate way of relating to a child
- Means engaging, respecting, and getting in tune with the child in order to help the child elaborate through gestures, words, and pretend play (what is on the child's mind)

The goals are to target personal interaction to facilitate mastery of developmental skills and help professionals see children functionally integrated and connected.

Please have in front of you the green and orange handouts for the next part of the presentation.

- The Six Development Milestones
- The Five-Step Process
Strategies for Floor Time Intervention

• Follow the child’s lead and join them - it does not matter what they do as long as they initiate the move
• Persist in your pursuit
• Treat what the child does as intentional and purposeful - give new meanings
• Help the child do what they want to do
• Position yourself in front of the child

More Strategies

• Invest in whatever the child initiates or imitates
• Join perseverative play
• Do not treat avoidance or “no” as rejection
• Expand - keep going, play "dumb", do wrong moves, do as told

More Strategies

• Do not interrupt or change the subject as long as it is interactive
• Insist on a response
• Do not turn the session into a learning or teaching experience
Small Group Time
1. Find in your packet a small strip that has a word related to autism on it.
2. Find the person who has the same word on their strip and THAT'S YOUR PARTNER!
3. Discuss and role-play the Floor Time Scenario on the index card handed out to your group.
4. Be prepared to share your scenario with the large group.

Large Group Sharing
1. Share scenario
2. What are your feelings about the intervention?

Questions?
Informal Discussion

I encourage you to join me on November 15th at 3:15 p.m. in my classroom to discuss the floor time interventions you are trying in your classrooms. This can be a great sharing time and opportunity to ask any questions!

Floor Time Homework

- You will need to record at least 5 scenarios that you used in the classroom for children with ASD.
- Bring your data to Session 2
**QUIZ: HOW MUCH DO YOU KNOW ABOUT INTERVENTIONS AND TREATMENT PROGRAMS FOR CHILDREN WITH ASD?**

Directions: Please circle T if the statement is True or F is the statement is False.

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<tbody>
<tr>
<td>1.</td>
<td>ASD stands for Autism System Disorder.</td>
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<td>2.</td>
<td>Autism is four more times prevalent in boys than girls.</td>
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<td>3.</td>
<td>It is estimated to occur in as many as 1 in 66 individuals.</td>
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<td>4.</td>
<td>Autism is caused by only drug and alcohol abuse.</td>
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<td>5.</td>
<td>A child with autism most likely lacks eye contact with others.</td>
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<td>6.</td>
<td>There are five diagnosis of autism.</td>
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<td>8.</td>
<td>There are interventions and treatment programs that stress the importance of developing empathy and the ability to express their attachments to others in a typical fashion.</td>
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<tr>
<td>8.</td>
<td>Floor Time was developed by Andrew Bondy.</td>
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<tr>
<td>9.</td>
<td>ABA stands for Applied Behavior Analysis.</td>
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<tr>
<td>13.</td>
<td>PECS teaches children to initiate communication by exchanging a single picture for a desired item.</td>
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<tr>
<td>14.</td>
<td>Discrete Trial Training is taught with a small group of children.</td>
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</tr>
<tr>
<td>12.</td>
<td>Each discrete has five parts.</td>
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<tr>
<td>15.</td>
<td>Sensory integration therapy emphasizes the relation between sensory experiences and motor and behavior performance.</td>
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<tr>
<td>13.</td>
<td>A child with autism may not like to be touched or hugged.</td>
<td>T</td>
</tr>
<tr>
<td>14.</td>
<td>Children with autism have typically speech and language skills.</td>
<td>T</td>
</tr>
</tbody>
</table>
FLOOR TIME SCENARIOS

Scenario #1: Strategies for Engagement and Two-way Communication
Materials: Sensory toys
Hide a toy, and then make it magically reappear.

Scenario #2: Strategies for Engagement and Two-way Communication
Materials: Sensory toys (belled toy)
Drop a belled toy so that the child with hear the jingle.

Scenario #3: Strategies for Engagement and Two-way Communication
Materials: Sensory toys (tickle feather)
Bring a tickle feather closer, closer, closer until finally you tickle the child with it.

Scenario #4: Constructive Obstruction
Materials: Table and chair
Prior to table activity, remove child's chair away from the table. As child stands by table, approach child with a supportive attitude, sharing surprise, "Oh no what happened? What's the matter?" (Stretch problem as long as possible by playing "dumb."

Scenario #5: Helping the Child Build a Symbolic World
Materials: Playground Equipment
When the child climbs to the top of the playground equipment, pretend the child is climbing a tall mountain

Scenario #6: Helping the Child Build a Symbolic World
Materials: Playground Equipment
When a child slides down the slide at the playground, pretend the child is sliding into the ocean to watch out for the fish.

Scenario #7: Helping the Child Build a Symbolic World
Materials: Toys (cars, trucks, buses, etc)
As you play, help the child elaborate on personal intentions
- Ask who is driving the car,
- Where the car is going,
- Whether the child has enough money,
- Did the child remember to keys to the car,
- Why is the child going there,
- Why not somewhere else, etc.

Scenario #8: Helping the Child Build a Symbolic World
Materials: Toys & Doctor Kit
When a problem (boo-boo) happens create symbolic solutions. Get the doctor kit when the doll fall so the child can help the hurt doll.

Scenario #9: Helping the Child Build a Symbolic World
Materials: Toys & Tool Kit
When a problem (flat tire) happens create symbolic solutions. Get the tool kit when the car is broken or has a flat tire.

Scenario #10: Helping the Child Build a Symbolic World
Materials: Dolls
Be a player and take on a role with your figure. Talk directly to the dolls rather than questioning the child about what is happening or narrating.

Scenario #11: Helping the Child Build a Symbolic World
Materials: Toys (cars, buses, trucks)
Insert obstacles into the play. Make your bus block the road. Then speaking as a character, challenge the child to respond

Scenario #12: Helping the Child Build a Symbolic World
Materials: Symbolic figures (Barney, Disney, Sesame Street, etc)
Reenact familiar scenes or songs, create new ideas, and notice characters and themes the child may be avoiding or fear.

Scenario #13: Helping the Child Build a Symbolic World
Materials: (Toy people, doll house, etc)
As you play, match your tone of voice to the situation. Pretend to cry when a character is hurt, cheer loudly when character is happy, speak in a rough voice when you are playing the bad guy.

Scenario #14: Developing Abstract Thinking
Materials: Pretend play (swimming in pool)
If the child puts his foot in the pretend pool, ask if it’s cold.

Scenario #15: Developing Abstract Thinking
Materials: Pretend Play (house/kitchen)
If the child is thirsty, offer her an empty cup or invite her to a tea party.

Scenario #16: Developing Abstract Thinking
Materials: Pretend Play (house/kitchen)
If the child is hungry, open the toy refrigerator and offer some food, pretend to cook, or as if he will go to the pretend market with you to get things to eat.
Materials: Pretend Play (house/kitchen)
If the child wants to leave, give her pretend keys or a toy car.

Scenario #17: Developing Abstract Thinking
Materials: Pretend Play (house)
If the child lies down on the floor or couch, get a blanket or pillow, turn the lights off, and sing a lullaby.

Scenario #18: Developing Motor Planning Abilities
Materials: Puzzle
Put a puzzle piece in the wrong place.

Scenario #19: Developing Motor Planning Abilities
Materials: Toys
Bury desired objects under other toys and very different objects.

Scenario #20: Developing Motor Planning Abilities
Materials: Toys
Hide desired object from the place where the child last put it.

Scenario #21: Developing Motor Planning Abilities (provide destinations for actions)
Materials: ball
Child throws a ball – catch it in a basket

Scenario #22: Developing Motor Planning Abilities (provide destinations for actions)
Materials: Little people, animals
Child holds figure – bring over a toy slide, school bus, food (if child doesn’t use spontaneously, ask if the figure would like to .... give choices if needed...ask figure directly).

Scenario #23: Developing Motor Planning Abilities (provide destinations for actions)
Materials: Plate, plastic toy, sticks, etc)
Child taps – bring over drums

Scenario #24: Developing Motor Planning Abilities (provide destinations for actions)
Materials: Cars, garage
Child rolls car – bring over garage, crash into it, block with figure.

Scenario #25: Developing Motor Planning Abilities (provide destinations for actions)
Materials: Your hands
Child reaches for hand – play give me five, variations, dance.

Scenario #26: Developing Motor Planning Abilities (create problems to solve-require multiple steps)
Materials: Desired objects to open, untie, tape, rubber bands, etc.
Put desired objects in boxes to open, untie, remove tape or rubber band.

Scenario #27: Developing Motor Planning Abilities (create problems to solve-require multiple steps)
Materials: Tools, tape, rubber bands, band-aids
Pretend an object need to be fixed using various materials.

Scenario #28: Developing Motor Planning Abilities (encourage the child to initiate/continue action)
Materials: Any
Bring over the next step (puppet to each pretend food, mirror to see the hat).

Scenario #29: Developing Motor Planning Abilities (deal with consequences of actions symbolically)
Materials: Dolls
Baby doll falls (is dropped) – uh ho! He’s crying. Are you hurt? Get a band-aid. Go to the doctor. Call the ambulance...

Scenario #30: Developing Motor Planning Abilities (play interactive song-hand games)
Materials: Words to songs
Itsy bitsy spider
One potato, two potato
APPENDIX C

SESSION 2 PARTICIPANT HANDOUTS
SESSION 2 AGENDA

1:30 p.m. – Welcome, Review November 15th informal discussions

1:40 p.m. – Review Goals and Objectives

1:45 p.m. – Skill-based interventions and treatment programs

   Picture Exchange Communication System (PECS)

2:30 p.m. – Large group demonstrations

3:00 p.m. – Small group sharing

3:20 p.m. – Closing remarks and questions
GOALS AND OBJECTIVES

Goal 1: To provide the participant’s knowledge about skill-based interventions and treatment programs.

a) Teachers will view information about skill-based interventions and treatment programs.

b) Teachers will learn specific information about PECS.

Goal 2: To assist participants to learn how to implement PECS.

a) Teachers will discuss students in the classrooms that would benefit from PECS.

b) Teachers will discuss how to get started using PECS with at least one student in the classroom.

Goal 3: To explore benefits or disadvantages of PECS
SESSION 2 POWER POINT

Session #2

- 1:30 p.m. - Welcome, Review informal discussion on November 15th
- 1:40 p.m. - Review Goals and Objectives
- 1:45 p.m. - Skill-based interventions and treatment programs
  Picture Exchange Communication System (PECS)
- 2:30 p.m. - Large group demonstration
- 3:00 p.m. - Small group sharing
- 3:20 p.m. - Closing remarks and questions

Session #2 Goals and Objectives

Goal 1: To provide the participant a knowledge about skill-based interventions and treatment programs.
   a) Teachers will view information about skill-based programs.
   b) Teachers will learn specific information about PECS.
   c) Teachers will learn specific information about PECS.

Goal 2: To assist participants to learn how to implement PECS
   a) Teachers will discuss students in the classroom that would benefit from PECS.
   b) Teachers will discuss how to get started using PECS with at least one student in the classroom.
   c) To explore benefits or disadvantages of PECS
Skill-Based Treatment Programs

- Intent is to develop or support the demonstration of specific skills rather than promote relatedness and attachment.
- Focus and assess individual's performance and target specific skills to teach and adapt functioning.

Interventions and Treatment Programs

- Picture Exchange Communication System (PECS)
- Fast ForWord
- Azrin 24-Hour Toilet Training
- Visual Schedules
- Lindamood-Bell

Interventions and Treatment Programs

- Social Stories
- Van Dijk Approach
- Facilitated Communication
- Applied Behavior Analysis (ABA) and Discrete Trial Training (DTT)
- Joint Action Routines
What would you use PECS for?
• Take 3 minutes and discuss with a partner what you could use PECS for within a classroom.

Phases in PECS
• Phase One: Teaches students to initiate communication right from the start by exchanging a single picture for a highly desired item
• Phase Two: Teaches students to be persistent communicators - to actively seek out their pictures and to travel to someone to make a request
Phases in PECS

• Phase Three: Teaches students to discriminate pictures and to select the picture that represents the item they want.

• Phase Four: Teaches students to use sentence structure to make a request in the form of "I want ___."

• Phase Five: Teaches students to respond to the question "What do you want?"

• Phase Six: Teaches students to comment about things in their environment both spontaneously and in response to a question.

Large Group PECS Demonstrations

**I need volunteers**

If you are brave, a treat will be waiting for you!
Small Group Sharing

- Get into your teams (teachers and paraprofessionals).
- Support staff and administrators can mix up within the teams.

Discuss:
1. Which students in your classroom could benefit from PECS?
2. Pick at least 1 student to begin using PECS with.
3. How are you going to start PECS?
4. What materials will you need?

Questions?

PECS Homework

- Use the small group discussions to guide your homework:
  - Pick 1 student to begin using the PECS with, follow the phases developed by Bondy & Frost, and record activities used with PECS on data sheet provided.
  - Bring data sheet to Session 3
Informal Discussion

I encourage you to join me on January 15th at 3:15 p.m. in my classroom to discuss the PECS training you are trying in your classrooms. This can be a great sharing time and opportunity to ask any questions!
THE SIX DEVELOPMENTAL MILESTONES

1. Self-regulation and Interest in the World - children should achieve this milestone by the age of 3 months.

2. Forming Relationships, Attachment, Intimacy - children should achieve this milestone by the age of 8 months.

3. Intentional Two-Way Communication - children should achieve this milestone by the age of 9 months.

4. Complex Communication (Complex Sense of Self) - children should achieve this milestone by the age of 12-18 months.

5. Emotional Ideas - children should achieve this milestone by the age of 14-36 months.

6. Emotional Thinking - children should achieve this milestone by the age of 36-48 months.

Http://home.sprintmail.com/~janettevance/six_developmental_mile
THE FIVE STEPS IN FLOOR TIME

<table>
<thead>
<tr>
<th>Step One:</th>
<th>Observation (observe the child’s facial expressions, tone of voice, gestures, body posture, and words to help you determine how to approach the child)</th>
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<tr>
<td>Step Two:</td>
<td>Approach-open circles of communication (approach the child with the appropriate words and gestures, can open the circle of communication with a child by acknowledging the child’s emotional tone, then elaborate and build on interests of the child at the moment)</td>
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<td>Step Three:</td>
<td>Follow the child’s lead (be a supportive play partner who is an “assistant” to the child and allows the child to set the tone, direct the action, and create personal dramas)</td>
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<td>Step Four:</td>
<td>Extend and explore play (make supportive comments about the child’s play without being intrusive, ask questions to stimulate creative thinking that can keep the play going)</td>
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<td>Step Five:</td>
<td>Child closes the circle of communication (the child will close the circle when the child builds on you comments and gestures with comments and gestures of own, one circle flows into another, and many circles may be opened and closed in quick succession as you interact with the child)</td>
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http://home.sprintmail.com/~janettevance/some_floor_timebasics.htm
PECS SCENARIOS

• **Phase One:** Teaches students to initiate communication right from the start by exchanging a single picture for a highly desired item.
  
  • **Materials:** Bubbles, picture of bubbles

• **Phase Two:** Teaches student to be persistent communicators—to actively seek out their pictures and to travel to some to make a request.
  
  • **Materials:** Communication binder with 2x2 pictures in side.

• **Phase Three:** Teaches students to discriminate pictures and to select the picture that represents the item they want.
  
  • **Materials:** Communication binder with a variety of pictures on outside to select from.

• **Phase Four:** Teaches students to use sentence structure to make a request in the form of “I want ____.”
  
  • **Materials:** Communication binder, choices of pictures, “I want ____.” Strip
<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Phase</th>
<th>Mastered (Y/N)</th>
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APPENDIX D

SESSION 3: PARTICIPANT HANDOUTS
SESSION 3 AGENDA

1:30 p.m. – Welcome, Review January 15th informal discussions

1:40 p.m. – Review Goals and Objectives

1:45 p.m. – Skill-based interventions and treatment programs

   Discrete Trial Training (DTT)

2:45 p.m. – Small group discussions

3:00 p.m. – Large group sharing

3:20 p.m. – Closing remarks and questions
GOALS AND OBJECTIVES

Session 3

Goal 1: To provide the participants information about DTT.
   a) Teachers will view information about DTT.
   b) Teachers will learn about the five parts of each discrete trial.

Goal 2: To assist participants to learn how to implement DTT.
   a) Teachers will evaluate children with ASD to determine which
      student(s) could benefit from DTT.
   b) Teachers will implement DTT with the determined student(s) in their
      classroom.

Goal 3: To explore benefits or disadvantages of DTT
Informal Discussion

I encourage you to join me on January 15th at 3:15 p.m. in my classroom to discuss the PECS training you are trying in your classrooms. This can be a great sharing time and opportunity to ask any questions!

Session #3

- 1:30 p.m. - Welcome, Review January 15th informal discussions
- 1:40 p.m. - Review Goals and Objectives
- 1:45 p.m. - Skill-based interventions and treatment programs
  - Discrete Trial Training (DTT)
- 2:45 p.m. - Small group discussions
- 3:00 p.m. - Large group sharing
- 3:20 p.m. - Closing remarks and questions
Session #3 Goals and Objectives

- Goal 1: To provide the participants information about DTT.
  a) Teachers will view information about DTT.
  b) Teachers will learn about the fine parts of each discrete trial.
- Goal 2: To assist participants to learn how to implement DTT.
  a) Teachers will evaluate children with ASD to determine which students could benefit from DTT.
  b) Teachers will implement DTT with the determined student(s) in their classrooms.
- Goal 3: To explore benefits or disadvantages of DTT.

Skill-Based Interventions and Treatment Programs

Applied Behavior Analysis (ABA)
including
Discrete Trial Training (DTT)

ABA

- Study of behavior and the manipulation of contingencies and setting events to increase or decrease specific behaviors
- O. Ivar Lovaas has researched methods of ABA for 30 years.
  (Lovaas, 1987)
• Take 3 minutes and discuss with your partner if you have done DTT or observed the training.

• Is one small subset of ABA or one aspect of ABA.
• "Discrete Trial" in DTT refers to the basic teaching unit delivered in one-to-one instruction.
• Highly structured teacher direction in a trial-by-trial format (child is instructed on a single skill a number of times during a single session).

(Schreibman & Walker, 2002)

Outcomes of seemingly small increments of learning are quantified and measured to ensure progress in many academic areas (Saxe, 1987).

Useful when teaching new forms of behavior such as speech sounds or motor movements that a child previously could not make. (Semel, 2004)
DTT

- Should be combined with other interventions to enable children to initiate the use of their skills and display these skills across settings.
- There are controversial issues regarding the amount of time that is appropriate for DTT in young children.

(Smith, 2001)

Each discrete has five parts:

1. Cue
2. Prompt
3. Response
4. Consequence
5. Intertrial interval

(Smith, 2001)

Cue

The teacher presents a brief clear instruction or question

Example: "Do this" or "What is this?"
Prompt
At the same time as the cue, or immediately after it, the teacher assists the child in responding correctly to the cue.

Example: The teacher may take the child’s hand and guide him or her to perform the response, or the teacher may model the response. As the child progresses, the teacher gradually fades out and ultimately eliminates the prompt so the child learns to respond to the cue alone.

Response
The gives a correct or incorrect answer to the teacher’s cue

Consequence
If the child gives a correct or incorrect response, the teacher immediately reinforces the response with praise, hugs, small bites of food, access to toys, or other activities the child enjoys, and if the child gives an incorrect response, the teacher says "NO," looks away, removes teaching materials, or otherwise signals that the response was incorrect.
After giving the consequence, the teacher pauses briefly (1-5 seconds) before presenting the cue for the next trial.

Examples of DTT:
- "Do this"
- "Give me"
- "Point to car"
- "Touch nose"
- "Find same"
- "Put in"

Refer to your data sheets as we go through each example.

DTT:
- Provide demonstrations of different types of DTT to use on young children.
- Demonstrate how to record data on DTT sheets.
- Need VOLUNTEERS to help with the demonstrations.
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**Small Groups**

- Break into your teams (support staff and administrators join any team)
- Role-play example of DTT on index card handed out to your group.
- Discuss questions about it.
- What other skills can be taught through DTT?
- Pick a child and set up a DTT. Be prepared to share your idea with the large group.

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**Large Group Sharing**

1. Questions about DTT handed out on index cards.
2. Share DTT set up for a child in your classroom.

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**Questions?**
DTT Homework

- You will need to implement a DTT with a child and record the data on the sheets provided

- Bring your data to Session 4

Informal Discussion

I encourage you to join me on March 15th at 3:15 p.m. in my classroom to discuss the DTT you are trying in your classrooms. This can be a great sharing time and opportunity to ask any questions!
<table>
<thead>
<tr>
<th>Skill/Instruction</th>
<th>Beginning</th>
<th>Mastered/Changed</th>
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<tbody>
<tr>
<td>&quot;Put in&quot;: Two-hole shape sorter</td>
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### DISCRETE TRIAL DAILY DATA SHEET

**Name of Skill:** ____________________________

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<th>Date</th>
<th>Instruction</th>
<th>Prompts</th>
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APPENDIX E

SESSION 4: PARTICIPANT HANDOUTS
SESSION 4 AGENDA

1:30 p.m. – Welcome, Review informal discussion on March 15th, Quiz: How much do you know about interventions and treatment programs for children with ASD?

1:45 p.m. – Review Goals and Objectives

1:50 p.m. – Physiologically oriented interventions and treatment programs

   Sensory Integration Therapy (SI)

2:40 p.m. – Small group (manipulating items)

2:55 p.m. – Overview

3:00 p.m. – Questions

3:15 p.m. – Presenter evaluation
GOALS AND OBJECTIVES

Session 4

Goal 1: To provide the participant’s knowledge about physiologically oriented interventions and treatment.
   a) Teachers will view information about SI.
   b) Teachers will different strategies to use with children with ASD.

Goal 2: To learn about Sensory Integration Therapy (SI).
   a) Teachers will manipulate materials used during SI.

Goal 3: To learn how to implement SI into their classrooms.
   a) Teachers will implement SI with the determined student(s) in their classrooms.
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Session #4

- 1:30 p.m. - Welcome. Review informal discussion on March 15th. Quiz: How much do you know about interventions and treatment programs for children with ASD?
- 1:45 p.m. - Review Goals and Objectives
- 1:50 p.m. - Physiologically oriented interventions and treatment programs
  - Sensory Integration Therapy
- 2:40 p.m. - Small group (manipulating items)
- 2:55 p.m. - Overview
- 3:00 p.m. - Questions
- 3:15 p.m. - Presenter evaluation

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Session #4 Goals and Objectives

- Goal 1: To provide the participant with knowledge about physiologically oriented interventions and treatment programs
  - Teachers will use information about SI
  - Teachers will design an intervention to use with children with ASD.
- Goal 2: To learn about Sensory Integration Therapy (SI)
  - Teachers will manipulate materials used during SI.
- Goal 3: To learn how to implement SI into their classrooms
  - Teachers will implement SI with determined student(s) in their classrooms.
Physiologically Oriented Interventions and treatment programs

- Address the neurologic dysfunction that is believed to be at the core of ASD
- Attempt to modulate how information is received in the brain, alter how the neurologic system processes information, and/or affect behavioral output from the inside out.
  
  (Hafler & Symon, 1991)

- Emphasizes changing the internal state of the individual, specifically his or her neurologic functioning.

  (Hafler & Symon, 1991)

- Sensory Integration therapy (SI)
- Rhythmic Entrainment
- Auditory Integration Training (AIT)
- Iren Lenses
- Psychopharmacologic Treatments
- Vision Therapy

  (Hafler & Symon, 1991)
Sensory Integration Therapy

- Based on theory developed by Ayres in 1972, 1979.
- Emphasizes the relation between sensory experiences and motor and behavior performance.

Strategies to use in the classroom

1. Brushing technique
2. The Ready Approach
3. Heavy work activities

Large Group Demonstrations

- Brushing Technique
  - Known as the Wilbarger Protocol
  - Developed in 1991 by Patricia Wilbarger, who specializes in sensory defensiveness
  - Specific professionally guided treatment regime designed to reduce sensory defensiveness

(Sawyer & Wilbarger, 2000)

(Wilbarger & Wilbarger, 1991)
Brushing Technique

- This technique has to be taught and supervised by a trained occupational therapist.
- On May 15th at 3:15 p.m., an occupational therapist will teach the brushing approach to us. (Part of your homework assignment for this session is to attend the informal discussion to learn about this technique)

[Reference: [Hilburger & Hilburger, 1991]]

Brushing Technique

- Brush will be provided to explore during small group time.
- Protocol: Apply heavy, consistent pressure, on the arms, hands, back, legs and feet in an up and down motion using the special surgical brush provided.

[Reference: [Hilburger & Hilburger, 1991]]

The Ready Approach

- Developed by Bonnie Hanschu to treat what she was sensory processing problems.
- Called the ready approach because she observed many individuals with sensory issues that were so overwhelmed, that they were not in a state that is ready to learn.
The Ready Approach

• AHH's (Achieved through Hand-Hugs)
  - Intended to bring out positive emotion, to feel good, be reassuring, soothing, and comforting

Examples:

• Hugs (soothing pressure strokes down an arm, or down the back)
• Hand-Hugs (pressing the surface of the skin from two opposite sides of an extremity; can be given up or down the arm or leg, firm presses down the back)
• Snuggling (being wrapped tightly and held while gently swayed from side to side)

Heavy Work

• There is heavy work that benefits children who are sensory defensive.
• Proprioceptive input can have powerful calming and organizing effects on your nervous system.
• Activities can help to inhibit or prevent uncomfortable reactions to sensations.
Examples:

- Stair climbing
- Crawling
- Playing "Tug of War"
- Pulling/Pushing
- Carrying heavy items
- Big Ball activities
- Scooter board
- Silly animal walks
- Pushing against the wall
- Swinging while someone pulls on legs
- Pulling apart resistance toys

Small groups

In groups of 3, manipulate the sensory items and think about what students could benefit from these strategies.

SI Homework

- Use 2 SI strategies with students in your classroom during the remaining school year. There is no data to record.
- Please experiment with the different strategies
- Attend informal discussion meeting
Informal Discussion

- You need to join me on May 15th at 3:15 p.m. to learn the brushing technique from our occupational therapist.

- This can be a great sharing time and opportunity to ask any questions!

Overview

- Write down three things you learned throughout the four sessions that will benefit children with ASD in your classrooms.

- Please share one with the large group.

Questions?

Last time for them!
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**Evaluation Time**

Please take the few minutes that are remaining and fill out the presenter evaluation. I hope that I presented information that is important to you and beneficial for you when teaching children with ASD.

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**Contact Me!**

- Contact me with questions or concerns about the information provided ANY TIME!

Call-Jones Early Childhood Center
(578) 554-1345
Email: mliecht@dbuque.k12.ia.us

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**References**


References

Children and Youth with Autism: Proven Changes in a World
of Myths. In J.L. Hoff & B.L. Simpson (Eds.),
Intervention and Treatment Options Review - Focus on Autism
and Other Developmental Disabilities. Vol. 1. No. 4, Winter

Horvath, B.
http://www.autism-society.org/system.html


References

www.autism-society.org
www.autismspeaks.com
www.pecc.com
www.polyx.com
EVALUATION FORM FOR PARTICIPANTS

Name: (Optional) ____________________________________________

Current Position: ____________________________________________

Date of Evaluation: __________________________________________

Please circle YES or NO for each question.

1. Was Floor Time beneficial to use in your classroom? _______ YES _______ NO

2. Was PECS beneficial to use in your classroom? _______ YES _______ NO

3. Was DTT beneficial to use in your classroom? _______ YES _______ NO

4. Was SI beneficial to use in your classroom? _______ YES _______ NO

5. Are you going to continue to use the interventions and treatment programs? If so, which ones _______________________________ _______ YES _______ NO

6. Which intervention or treatment program did you use the most? ________________________________________________________

7. Which intervention or treatment program did you use the least? ________________________________________________________

8. Are there other interventions and treatment programs you would like to learn more about? ________________________________

9. What could be done to improve professional development sessions for next year? ____________________________________________

10. Comments: ______________________________________________

_________________________________________________________

_________________________________________________________

_________________________________________________________

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INFORMATION ON AUTISM SPECTRUM DISORDERS

BOOKS:

JOURNALS:
American Journal on Mental Retardation
Assessment for Effective Intervention
Clinical Psychology: Research and Practice
Education and Training in Developmental Disabilities
Journal of Autism and Development Disorders
Occupational Therapy Journal of Research
Topics in Early Childhood Special Education

WEBSITES:
Http://www.autism.ca/occlher.htm
Http://www.asatoline.org
Http://www.autism-inda.org
Http://autismeducation.net
Http://www.autism.org/sihtml
Http://www.autism-society.org
Http://www.floortime.org
Http://www.jcdl.com
Http://www.pecs.com
Http://polyxo.com
Http://www.shapingbehavior.com
Http://toddlerstoday.com