Evaluation and Needs-Based Assessment of Special Education Teachers' Knowledge of Autism Interventions

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EVALUATION AND NEEDS-BASED ASSESSMENT OF SPECIAL EDUCATION
TEACHERS’ KNOWLEDGE OF AUTISM INTERVENTIONS

A Specialist Project
Presented to
The Faculty of the Department of Psychology
Western Kentucky University
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Specialist in Education

By
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EVALUATION AND NEEDS-BASED ASSESSMENT OF SPECIAL EDUCATION TEACHER'S KNOWLEDGE OF AUTISM INTERVENTIONS

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Autism Spectrum Disorder (ASD) is being increasingly identified in children, yet there are only a minimal number of studies examining the use of research-based intervention strategies in a classroom educational setting. This present study examined the use of Discrete Trial Training, Picture Exchange Communication System, Social Stories, Structured Teaching, and Video Self-Modeling by special education teachers with students with ASD. A questionnaire was completed by 91 special education teachers from the Green River Region Educational Cooperative, which encompasses 17 different school districts in the area of western and south central Kentucky. They answered questions about their level of training, knowledge and current use of the five strategies. A correlational analysis was performed to assess whether the years of teaching experience was related to the level of the teacher’s training, knowledge and current use of the ASD instructional methods, and whether special teachers who taught a greater number of students with ASD had greater levels of training, knowledge, and current use of the five methods. The study revealed correlations between the numbers of students taught with ASD and some of the levels of training, knowledge, and current use of the interventions.
Introduction

The passage of the Education for All Handicapped Children Act in 1975 was a significant event because, for the first time, the federal government required all public schools to provide special education services to children with disabilities (Fagan & Wise, 2007). However, it was not until 1991 that Autism Spectrum Disorder (ASD) was recognized as a separate eligibility category for special education services. Since then there has been a continual increase in the number of children who receive services based on this diagnosis. According to information available from the United States Government Accountability Office (2005), over 100,000 school-aged children were diagnosed with some form of ASD. In fact, the most recent data from the Centers for Disease Control and Prevention (2007) show an autism prevalence rate of 6.6 per 1,000 children. This current prevalence rate equates to 1 in every 150 children.

Increased awareness and identification of ASD has resulted in more children being brought into the educational system with specialized needs. While the awareness and identification of ASD has grown, information on specific educational interventions has not kept pace. Based on general recommendations, the National Research Council (NRC, 2001) stated that children 8 years and younger diagnosed with ASD should be immediately enrolled into intensive programs. The NRC, however, gave only a general description of what such a program would look like by specifying the minimum weekly hours of student involvement, and an adult to child class ratio. There was no mention of specific interventions with research-supported efficacy. This was due in part to the lack of research identifying effective interventions. In fact, Kasari (2002) advocated for researchers in the field of autism to consider “the active ingredients or
component parts of an intervention” (p. 447), and for greater scientific rigor in future studies in order to identify efficacious interventions for children with autism.

Federal legislation has also addressed the need for research-based educational initiatives. Recently, President Bush signed the Combating Autism Act (2006) authorizing funds for autism education, early detection, and autism research. Part of the research focus is to identify effective interventions for improving educational outcomes of children identified with ASD. This was in response to the current lack of research-based intervention strategies, although the need for such interventions is not recent. The No Child Left Behind Act (2001) stated that research-based teaching methods should be employed in the classroom for all children. In addition, a key component of the Individuals with Disabilities Education Improvement Act (2004) emphasized research-based interventions in special education settings. However, at the present time there is little consensus as to what constitutes research-based school interventions for children identified with ASD (C. Rosenquist, personal communication, March 2, 2007; Kasari, 2002).

While some interventions, such as Applied Behavior Analysis, have a research track record of efficacy in educational settings (Dunlap, Kern & Worcester, 2001; Herin, & Simpson, 1998) and with certain characteristics of ASD (Reed, Osborne, & Corness, 2007; Schoen, 2003), many interventions purported to reduce symptoms or increase learning are experimental at best. Young children and students identified with ASD in the school system, therefore, are exposed to interventions with variable levels of research support and effectiveness. Without the dissemination of evidence-based interventions, and because of a lack of consistency in state or local educational agency guidelines,
special education teachers are pressured to make their own determinations as to what constitutes an appropriate intervention for a student with ASD (Stahmer & Mandell, 2007).

The purpose of this research was to examine special education teachers’ familiarity with specific instructional methods developed for children with ASD, the methods used in their classrooms, and their perceived levels of competency with such interventions. Such data were collected by surveying special education teachers from a local region of Kentucky with the results of the study being used to determine the training needs for this region. The interventions selected for inclusion in this study were chosen based on a literature review of interventions with research support. Criteria for inclusion included (a) the ease of providing the intervention in the classroom setting, (b) commonly used procedures, and (c) the intervention focus being educational in nature, rather than on a physiological characteristic of the disorder, such as sensory perception or neurological dysfunction. Based on these three criteria, the intervention options chosen for this study based on their focus on improving educational outcomes for students diagnosed with autistic spectrum disorders were (a) Discrete Trial Training, (b) Picture Exchange Communication System, (c) Social Stories, (d) Video Self-Modeling, and (e) Structured Teaching. Structured Teaching is a major aspect of a comprehensive treatment program called the Treatment and Education of Autistic and Related Communication Handicapped Children (TEACCH) from the University of North Carolina. Because of its comprehensive nature (e.g., parent component, specialized training) the TEACCH program itself was not reviewed.
Literature Review

*Discrete Trial Training*

Discrete Trial Training (DTT) is an instructional method based on the learning principles of Applied Behavior Analysis (ABA) and, unlike ABA, was developed specifically for children with autism related symptoms. A highly structured approach, DTT focuses on the behavior or skill a child is not performing, or performing incorrectly, by breaking down the behavior into small specific parts and then teaching each part separately until the child can perform all the parts in combination. A discrete trial consists of the teacher presenting a stimulus (the cue), assisting the child as necessary in giving a specific response (the prompt), the response by the child, and the positive or negative reinforcement (the consequence) administered by the teacher (Smith, 2001). By providing instruction in this step-by-step manner, a variety of core skills or behaviors can be taught.

The DTT approach came out of the UCLA Young Autism Project directed by Ivar Lovaas (Lovaas, 1987; National Autistic Society, n.d.). The original method conducted by Lovaas used intensive (an average of 40 hours a week for two or more years) one-on-one treatment focusing on the reduction of negative behaviors and the increase of language and communication skills. Lovaas (1987) described the construction of the intervention as a “special, intense, and comprehensive learning environment” (p. 4). This intensive behavior therapy approach is sometimes known as the Lovaas method and the instructional techniques as DTT.

In Lovaas’ (1987) original study, children who were included who met three criteria: an independent diagnosis of autism from a professional, a chronological age of
less than 40 months if mute and less than 46 months if echolalic, and a prorated mental age of 11 months or more at the chronological age of 30 months. An experimental group of 19 children experienced the intensive one-on-one treatment weekly for two years, and a control group, also of 19 children with ASD, received minimal one-on-one intervention of less than 10 hours of intervention weekly. In the first year of treatment, the focus was on the reduction of target behaviors, such as aggressive behaviors or self-stimulatory ones, and increasing compliance to verbal requests, imitation, and appropriate play with toys. The focus of the second year was on language skills and appropriate play with peers. Lovaas found that, of the 19 children in the experimental group, 47% “achieved normal intellectual and educational functioning in contrast to only 2% of the control group subjects” (p. 7). With the publication of such positive results, the utilization of DTT in teaching children with ASD grew.

However, Gresham, Beebe-Frankenberger and MacMillan (1999) performed a methodological analysis of the research support for DTT and noted a number of concerns in those research designs when compared to conventional standards of research design and methodology. One concern was that the original Lovaas study did not utilize a true experimental design, although few applied studies can take advantage of such a design. Another concern was that some of the methods used involved punitive measures. Finally, the astounding claims of an autism “cure” were suspect. Gresham et al. stated that the “threats to internal and external validity are sufficient enough to question the findings of these studies” (p. 564). While the original Lovaas study and other DTT research studies reviewed by Gresham et al. did not meet the rigorous standards advocated, the authors acknowledged that the findings from these studies demonstrated gains in cognitive and
social functioning, and that there exists a research track record supporting the use of DTT as a component in the treatment of children with ASD.

Other researchers have used DTT to teach language skills to children with ASD. Results have been mixed. Goldstein (2002) reviewed 12 research studies that examined language acquisition interventions employing a variety of DTT formats. There was a variance in the types of communication patterns of interest, the experimental designs, the numbers and ages of subjects, and the durations of interventions. Because of the wide range of variables, only a general conclusion was drawn that the interventions were mostly effective in teaching the communication skill of interest through DTT. Goldstein did note a concern that the generalization of skills to other settings was not always demonstrated, but speculated that it was possible if specific attention were paid to the conditions promoting the transfer of skills, such as the careful selection of the training exemplar from a context relevant to a child.

Although Goldstein’s (2002) review found somewhat favorable results for DTT, Delprato’s (2001) review of 10 research studies comparing the use of DTT and normalized behavioral language interventions indicated the results favored the use of normalized language training to teach language skills. Delprato (2001) described normalized interventions as ones using minimally structured, indirect teaching opportunities in normal everyday teaching situations with some child initiation of the teaching situation. All of the children in the studies met at least one criterion for autism, although their level of communication skills varied. The type of language skill measured differed between studies. In the eight studies that evaluated language criterion responses,
such as imitative speech or receptive language response, the results demonstrated that using normalized language training was more effective than DTT.

DTT has been used successfully in the past in numerous research studies and educational settings to teach children diagnosed with ASD to succeed in the regular education classroom (Sallows & Graupner, 2005), to attain a variety of skills used in structured settings (Weiss, 2005) and “for teaching children with autism to add new forms of behavior to their repertoires and to make new discriminations between events” (Smith, 2001, p. 87). It may be the case that DTT has the greatest efficacy with specific characteristics of autism, yet to be definitively established.

**Picture Exchange Communication System**

The Picture Exchange Communication System (PECS) was developed at the Delaware Autistic Program to provide a way for children to communicate who are non-verbal or who lack expressive skills and “potentially providing a bridge to speech acquisition” (Schwartz & Garfinkle, 1998, p. 1). PECS is a highly structured program with multiple steps. Following the specific six-step program leads the child with autism through the acquisition and utilization of a picture-based communication system, expanding their expressive communication skills.

As laid out by Bondy and Frost (1994), the first step in PECS focuses on teaching the child to request what she wants by exchanging a picture for the object. The picture is of an item that is a reinforcer for the child. The goal is for the child to make the exchange with another person when in close physical proximity. The second step is to build upon this behavior until the child initiates the exchange even when not in close proximity to either the adult or the picture. She has to go to a certain location, obtain the
picture of the desired item, take it to the adult, get the adult’s attention in an appropriate manner and make the exchange. The goal is to create a more spontaneous communication exchange. During the third step, she learns to discriminate initially between two pictures of items that are reinforcers and then between multiple pictures. The goal is to increase the reinforcer choices available to use in communication. During fourth step, the child learns to build sentence structure with printed word phrases and pictures. Using the written phrase “I want,” the child presents the phrase and a picture when a reinforcer is desired. The goal is for the child to put the request in a sentence form. The fifth step has the child learning to respond to verbal prompts. The adult asks, “What do you want?” and points to the written “I want” phrase. The child learns to respond by completing the written phrase with the picture of the desired reinforcer. The sixth step has the child identify items by responding to a question phrase such as “What do you see?” The goal is for the child to be able to label or name things without receiving a reinforcer. Of course, the ultimate goal of the PECS method is for the child to initiate and participate in verbal communication with others.

Research has demonstrated an increase in communication skills and verbal expression when using PECS with children with ASD. Bondy and Frost (1994) reviewed 5 years of data concerning 85 children with ASD who had been taught to communicate with PECS. All of the children were 5 years old or younger upon beginning PECS training, and classified as lacking functional speech or an alternative communication system. Bondy and Frost found that of the 66 children who used PECS for over a year, 59% communicated primarily with speech. Seventy-six percent of the entire sample of
85 children used speech only or speech with the picture-based system to communicate after being trained with PECS.

While not experimental studies, two studies undertaken by Schwartz and Garfinkle (1998) demonstrated that some children could learn to communicate verbally after being taught PECS and that such communication was evident across a variety of settings. The first study was composed of 31 preschool children, 16 of whom were diagnosed with an ASD, and all of who had severe communication, cognitive and social delays. The PECS instruction occurred in a university-affiliated preschool classroom. Trained instructors utilized the PECS format with the children during normal classroom activities, sometimes conducting additional training as needed with a child during free time or recess. The researchers found that after an average of 14 months, with a range of 3 to 28 months, all children were using PECS to communicate. A follow-up study by Schwartz and Garfinkle (1998) with a subset of 18 of those same students looked for spontaneous speech expressions of the preschoolers during unstructured class time. Of these 18 preschoolers, 44% were observed to use unprompted speech in addition to PECS.

More empirical support for the use of PECS to increase communication comes from a single-subject design by Ganz and Simpson (2004). Three students, with either ASD or developmental delays with autistic characteristics, received PECS training in two to five sessions weekly, for 15 trials per session, in the elementary classroom until the first four steps of PECS were mastered. Over the course of intervention, the three students "demonstrated increases in average intelligible words spoken per trial (and the) generalization of skills with a variety of adults" (Ganz & Simpson, 2004, p. 405).
In a comparison of the efficacy of the use of PECS in increasing verbal communication to the use of Responsive Education and Prelinguistic Milieu Teaching (RPMT), Yoder and Stone (2006) examined the interventions with 36 preschoolers with ASD described as low verbal or non-verbal. RPMT consists of both a parent education component and a child initiated, play-based method of teaching communication. The child component initially focuses on teaching gestures and other pre-linguistic communication skills, then later using prompts to illicit verbal imitation and spoken communication. Over a six-month treatment period, with a maximum total of 24 hours of intervention time, they measured the frequency of non-imitative spoken communication acts, and the number of non-imitative words spoken. In a statistical analysis they found a main treatment effect for the PECS treatment on both of the measures. They also stated that the significant treatment effect was important to note because the children made the gains with only three 20-minute sessions per week, which was much less than the RPMT method.

Social Stories™

The Social Story intervention was developed by Carol Gray, who is a former educator and current consultant for children with autism. The concept of Social Stories is to provide a child with an individualized story that addresses a social issue that is challenging to that child. The story explains the social interaction and illustrates the appropriate actions for the specific situation. “The goal of a Social Story is to share accurate information in a patient and reassuring manner that is easily understood by its audience…not to change the individual’s behavior” (The Gray Center, n.d.). It was suggested that “at least 50% of all the Stories developed for any person should
congratulate or applaud current skills/abilities/personality traits/or concepts that the
person does well” (The Gray Center, n.d.).

Over time, the development of the Social Stories concept has brought about some
changes in the defining criteria and guidelines that shape the story’s creation (Reynhout
& Carter, 2006). Gray suggests that four basic types of sentences are the foundation for
the story: descriptive, directive, perspective and affirmative. Delano and Snell (2006),
when discussing Gray’s recommended style, describe the relationship among sentence
types as “a ratio of 2 to 5 descriptive, perspective, and/or affirmative sentences for every
0 to 1 directive sentence” (p. 29). In addition, sentence types such as control or
cooperative ones can be used. Guidelines also direct the story format and focus. For
example, guidelines direct that the story should be at the child’s level of comprehension,
behaviors performed in the story be presented in a positive manner, and the stories should
be written from the perspective of the child (Reynhout & Carter, 2006).

Some research studies have examined the use of Social Stories in tandem with
other interventions and the results indicated a positive behavior change. One such recent
study by Bernad-Ripoll (2007) used the dual intervention of Social Stories and video-self
modeling where a child with Asperger syndrome was taught to recognize emotions. In
this instance, a nine-year old boy having superior cognitive skills yet challenged in
managing emotions, was the subject of an intervention using Social Stories and video
self-modeling to identify emotions and demonstrate appropriate responses. The
intervention consisted of reading one of two Social Stories related to specific emotions
and viewing a videotape of different emotions over the course of 27 sessions. The results
demonstrated the effectiveness of this dual intervention in helping the subject recognize
his emotional response to a situation, determine an appropriate action response, and generalize this to new conditions.

A study by Scattone, Wilczynski, Edwards, and Rabian (2002) examined the effects of Social Stories written under Gray’s guidelines in decreasing the disruptive classroom behavior of three children with autism. Using a multiple baseline design, individualized stories were read daily for nine weeks, and the resulting data demonstrated a decrease in each student’s disruptive behaviors. The authors found that the level of improvement in the behaviors varied with each individual. They also noted some possible threats to internal validity, such as teacher prompts related to the intervention, and two of the students exposed to the other student’s Social Story.

Other more recent studies have looked at increasing positive behaviors instead of decreasing disruptive ones. Scattone, Tingstrom, and Wilczynski (2006) evaluated the use of a Social Story intervention with three students with ASD who did not initiate interaction with peers or respond appropriately to them. Individualized stories were read daily during the intervention phase and the resulting observations found an increase of positive social behaviors for two of the three autistic children. In another study targeting positive behavior change, Delano and Snell (2006) evaluated the effects of a Social Story on increasing social interaction time and specific target skills with three elementary aged students with ASD. The intervention was composed of reading the story, followed by a check for the student’s comprehension of the story, and then a play session with peers. Observation of peer interaction found an increase in positive behaviors, and an increase in some, but not all, of the target skills. However, the researchers also noted that the
maintenance of the behaviors was a concern once the intervention was faded, because the students' levels of engagement were variable.

In a recent review of the literature with 16 studies of Social Stories targeting either disruptive behaviors, on-task behaviors, social, or communication skills, Reynhout and Carter (2006) found conflicting results. Their examination of results discovered a range of effect sizes in the different studies, and variable behavior changes both positive and negative. Reynhout and Carter questioned the prescribed story guidelines, stating that Gray's multiple directions for Social Stories are complex and it was "unclear from the present review that the prescribed (and complex) story construction is necessary to the efficacy of the intervention, which components are critical to effectiveness, and whether Social Stories necessarily add to the effectiveness of other interventions" (p. 465). Research is ongoing to try to determine the essential elements for effective interventions with Social Stories (McDade, 2007).

Structured Teaching

The Treatment and Education of Autistic and related Communication-handicapped Children (TEACCH) program is part of the University of North Carolina's Department of Psychiatry. In 1972, by order of the North Carolina General Assembly, it became the first comprehensive statewide community-based service program for children and adults with ASD. It is a comprehensive treatment program that offers a range of services for the child or adult with ASD. TEACCH incorporates family services and parent training as part of the intervention strategy with the focus on the individual by understanding the personal skills, needs and interests, and then developing an intervention strategy based on such. The program goal is based on “improving the
individual’s skills and developing environmental adaptations to autism-related deficits” (Gresham et al., 1999, p. 566) with the use of cognitive-behavioral interventions, visual stimuli in the learning environment, structured teaching, and parent education and collaboration.

The intervention approach from the TEACCH program that can be applied in a classroom setting is called structured teaching. Structured teaching is characterized by three components: physical organization, schedules, and task organization (Division TEACCH, n.d.). The physical organization component relates to the importance of how a classroom is physically structured with separate defined areas for different tasks. An important part of the physical organization is work areas or stations where the children engage in a specific task. The schedules used in the classroom provide a daily framework for either group or individual activities, and are detailed in a visual system relating to the strength of the visual nature of many children with ASD. Teaching the students requires the organization of tasks in a systematic manner, providing a clear visual structure to the activities for the children.

Schopler (1987), in a discussion of the TEACCH program, stated that specific factors such as structured teaching, along with nonspecific factors such as parent and staff enthusiasm, were important to the success of the approach. In a review of multiple ASD interventions Herin and Simpson (1998) stated that a number of research studies demonstrated the effectiveness of individual components of structured teaching. One such recent study by Hume and Odom (2007) examined the effects of an individual work system on three students with ASD. Two students in an elementary self-contained classroom and one student in a school transition program were trained in the use of a
work system. Through the use of a single-subject reversal research design, the students were observed without the work system, and trained in the use of the work system while their behaviors were observed. The results demonstrated that the students functioned more effectively in their independent work or play under the work system conditions, and the increased performance was maintained upon a one-month follow-up.

The TEACCH intervention has also been implemented in other countries with positive results. Panerai, Ferrante, Caputo, and Impellizzeri (1998) studied the effects of using the TEACCH methodology in special education settings in Italy and found positive results with the use of this intervention for 18 children and adolescents with autism. In a pretest/posttest comparison of cognitive ability, behavior, communication, developmental, and neuropsychological functioning after both 12 and 18 months of structured intervention, Panerai et al. found statistically significant differences in a number of the measured domains between the experimental and control group. Overall improvement was noted for the TEACCH subjects in the areas of competence, a reduction of behavioral problems and an increase in spontaneous communication.

More recently, in a comparison of a TEACCH program and a non-specific integration approach, Panerai, Ferrante, and Zingale (2002) found improved outcomes for the TEACCH program participants. During the study, eight children were in a residential program utilizing the TEACCH educational intervention over the course of a year while a matched control group of eight students was mainstreamed with the assistance of a support teacher for the same period of time. In a statistical analysis of pre and post intervention scores on the PsychoEducational Profile-Revised and the Vineland Adaptive Behavior Scale, Panerai et al. (2002) found that the students in the TEACCH condition
obtained statistically significant differences in scores on a number of domains imitation, 
cognitive performance, developmental age, etc. versus just one domain with a statistically 
significant difference for the control group.

In 1995, the “TEACCH program was identified by a special task force of the Hong Kong Government as a program that held the best promise for Chinese families with autistic members” (Tsang, Shek, Lam, Tang, & Cheung, 2007, p. 391). As part of the push to provide the services in a culturally relevant manner, research studies are ongoing. Tsang et al. (2007) published the results of a year-long study of 18 preschoolers, with an age range of three to five years old, who received seven hours of TEACCH instruction daily compared to a control group of 16 preschoolers. The researchers found, in statistical comparisons of the measurement scales, that the TEACCH intervention promoted “learning abilities like imitation, perception, fine motor, eye-hand coordination, gross motor skills, as well as cognitive functioning (pp. 394-395) as opposed to the control group. The TEACCH program continues to be implemented both nationally and internationally with research supporting its efficacy.

**Video Self-Modeling**

Video Self-Modeling (VSM) is based on the tenets of observational learning and has been utilized in two formats when studying its effectiveness with children with ASD. Either another person is the model in the video performing the desired behavior (video modeling), or the child with ASD is the model (video-self modeling). The purpose of the video is to demonstrate visually how to perform the appropriate behavior that is the intervention focus. In VSM, a videotape is made of the child performing portions of the desired behavior until the tape can be edited and compiled to show the child exhibiting
the complete behavior appropriately. When another person is the model, the behavior is simply recorded while being performed correctly. In the intervention phase, the child with autism is shown the video of the target behavior multiple times. Eventually, the child is placed in the situation depicted to allow the child to exhibit the behavior or skill. Research studies with video modeling and VSM have used the procedure to increase social behaviors, communication and functional living skills, as well as to decrease the challenging behaviors of children with autism.

Hitchcock, Dowrick, and Prater (2003) examined the research literature available detailing the use of VSM in a school-based setting. They looked at studies that used VSM in a school setting for a variety of issues, from academic to behavioral. The eighteen studies selected had a total of 129 students between the ages of 3 and 18 participating, all of whom had disabilities identified under either IDEA guidelines, Section 504 of the Rehabilitation Act, or who were considered at risk of academic or social failure. The students were in a variety of school educational settings, from a general education classroom to a self-contained class. While Hitchcock et al. did not identify any of the students as diagnosed with ASD, a number of the behaviors targeted in the VSM intervention were similar to ones that are a challenge for students with ASD. A number of the reviewed studies targeted speech and language issues, along with increasing appropriate and decreasing inappropriate classroom behavior. The results from all of the 18 studies demonstrated positive outcomes, and 15 of the 18 studies showed clear evidence that the behaviors were maintained during the scheduled follow-ups.
Buggey (2005) studied the effects of VSM on altering the behaviors of 10 students diagnosed with autism who attended inclusive classes in a small private school. A variety of behaviors was targeted depending on the students’ determined needs. These included increasing social initiations with peers or staff, decreasing tantrums, and decreasing aggressive behavior. Videos of each student were created either with the student following a script depicting the desired behavior, or acting in an undesirable manner to a situation and then acting in a positive response to a similar situation. The videos contained a short auditory introduction of the activity, had minimal narrative, and ended with positive verbal praise. During the intervention phase, the students watched the video prior to the beginning of the day’s class. Based on observational data, Buggey noted that there was an increase in the desirable behaviors, and a decrease in the undesirable ones, for all subjects both during intervention and when checked for maintenance of the desired behaviors after the intervention ceased.

Another area of study has examined the benefits of using VSM to increase the social engagement of children with ASD. Bellini, Akullian and Hopf (2007) studied the effects that daily viewing video clips of peer social interaction had on two preschoolers with ASD. During the four weeks of intervention, the two boys were shown one of three video clips made of them in appropriate social interaction, in a rotation so that the same clips were not viewed on consecutive days. After viewing the clips the boys were given free-play time. Bellini et al. found that “VSM led to rapid and substantial increases in unprompted social engagement with peers” (p. 88) and they determined that the behavior was maintained for both children after the intervention ceased.
Delano (2007) performed a review of 19 studies occurring between 1985 and 2005 that used a video modeling or VSM intervention with children with ASD. Twelve of the studies used video modeling (an adult or a peer was featured in the video) while five used VSM, and the remaining two were comparisons involving either type of video modeling and in-vivo modeling. Her review indicated that video modeling and VSM positively influenced the acquisition of a variety of skills and decreased problem behavior. “Fifty of the 55 participants who were included in the studies reviewed experienced positive gains in one or more target skills” (Delano, 2007, p. 39). The results in five of the 19 studies were variable. In addition, since the studies varied in many areas such as the type of skill assessed, setting where the research took place, and whether characteristics of validity, fidelity, generalization, and/or maintenance were evaluated, any encompassing conclusions regarding the efficacy of video modeling and VSM were limited.

A meta-analysis by Bellini and Akullian (2007) reviewed 23 single-subject designs using video modeling and VSM to examine the outcomes in three areas: social-communication skills, functional skills and behavioral functioning, and “to determine whether video modeling interventions meet the criteria for evidence-based practices” (p. 267). By evaluating the individual study results through the percentage of non-overlapping data points (PND), they were able to measure intervention effectiveness. Bellini and Akullian described the multiple studies in detail, noted the PND scores for the three different areas, and stated that the “results suggest that video modeling and VSM are effective intervention strategies for addressing social-communication skills,
behavioral functioning, and functional skills” (p. 281). VSM appears to have some research support for its use as an intervention with children with ASD.

*Purpose of Present Research*

The search is not near a conclusion to identify efficacious research-based interventions in the education setting for children with ASD. While the government established the requirement that interventions need to have research support, there is still a lack of consensus as to what constitutes the most effective interventions for children with ASD in a school setting. Therefore, there is not a specific set of mandated interventions for the teachers of students with ASD. In addition, there are variable educational standards as to what type of education or training special education teachers receive. The absence of autism training requirements means that special education teachers have different experiences and expertise with various teaching strategies and are left to their own individual decisions when choosing an intervention to work with the students with ASD.

The ramifications of this lack of consistent standards are evident in a recent study by Stahmer, Collings, and Palinkas (2005). They published a study of Early Intervention (EI) treatment providers of children with ASD. Utilizing focus groups they examined provider self-reports of intervention use with the children. Participants reported “the use of both evidence-based and non-evidence-based techniques and indicate(d) that they often combine(d) and modif(ied) these techniques based on child, personal and external factors” (Stahmer et al., 2005, p. 66). This type of approach means a lack of fidelity existed in the implementation of an evidence-based intervention because the participants were not implementing the evidence-based techniques as designed. Results from a single
study do not mean that all educators are using interventions in a manner that has not been verified as effective. However, it does imply that just awareness of an intervention may not be enough to guarantee the appropriate teaching or use of the intervention. Stahmer et al. noted the need to expand the study of provider use of interventions with a greater range of service providers.

Special education teachers are the service providers most likely to work with students with ASD. Because there is a lack of consistent special education requirements and training, it is a logical first step to evaluate teachers’ knowledge and training in the area of ASD interventions. Furthermore, gaining an understanding of teachers’ current use of interventions can assist with training in appropriate implementation of the interventions.

This study seeks to examine further the manner in which special education teachers work with students with ASD in the traditional school setting. The study was conducted at the request of personnel from the Caveland Educational Support Center to provide them with information to assist in planning future continuing education training in research-based ASD interventions. Being aware of teachers’ levels of knowledge and use of interventions for students with ASD, and knowing what additional training they desire, is a first step in planning for needed educational support.

With the approval of the educational cooperative, this present study seeks to add to the understanding of intervention use by teachers with children with ASD. By utilizing a questionnaire format, special education teachers in one region of the state of Kentucky were surveyed regarding their current knowledge, training and use of interventions for children with ASD. The increasing prevalence of the autism diagnosis
means special education teachers will be exposed to an increasing number of students with ASD. For teachers who have already had a number of students with autism, the need for a greater level of knowledge and training in research-based interventions specifically targeted towards ASD is more likely to be apparent. Thus, in the current study, the first hypothesis is that the teachers who have taught a greater number of students with ASD will have greater levels of training, knowledge, and current use of instructional methods. Special education teachers’ years of experience may not have included many, or any, students with autism and, because of this, they may not have had any exposure to specific instructional methods for children with autism. Therefore, it is further hypothesized that years of experience will have no relationship to the level of training, knowledge, and current use of the different instructional methods.
Method

Participants

Two hundred special education teachers attending a regional workshop sponsored by the Green River Region Educational Cooperative (GRREC) were invited to participate in this study. A total of 91 (45.5%) participated by completing the survey. These teachers taught at a variety of grade levels. Thirty-five (38.5%) respondents identified themselves as teaching at the elementary level, 20 (22.0%) at the middle school level, 25 (27.5%) at the high school level, 10 (11%) at a combination of levels, and one did not specify the grade level. The type of classroom or teaching role varied, with 47 (51.6%) teachers reporting they taught in a Functional Mental Disability classroom, 18 (19.8%) identified themselves as resource room teachers, 11 (12.1%) listed working in multiple types of classroom, four (4.4%) specified a Learning Behavior Disorder classroom, nine (9.9%) participants specified other types of classrooms or were consultants rather than teachers, and two (2.2%) participants did not answer the question.

Sixty-four (70.3%) of the teachers listed their highest level of education as masters level, 19 (20.9%) reported having a bachelors degree and eight (8.8%) identified another level of education. The years of experience teaching in a special education setting ranged from one to 31 ($M = 9.6, SD = 8.6$) with a range of one to 31 years ($M = 10.3, SD = 8.6$) reported as total years teaching experience. The Western Kentucky University Human Subjects Review Board granted permission (Appendix A) for this project along with the workshop sponsor, Green River Region Educational Cooperative (GRREC).
**Instrument**

A questionnaire (Appendix B) was developed by this author in conjunction with personnel from the Caveland Educational Support Center. In addition to demographic questions, questions regarding teaching experience working with children with ASD were included. The questions asked specifically about the teachers’ knowledge, level of training, training provider, and their current use of five different types of interventions: (a) Discrete Trial Training, (b) Picture Exchange Communication System, (c) Social Stories, (d) Structured Teaching, and (e) Video Self-Modeling. In addition, a set of questions asked the teachers if they wanted to receive a particular level of training in any of the interventions. Finally, through an open-ended response question, teachers were given the opportunity to describe any concerns that they had, or difficulties they had experienced, with any of the intervention techniques.

**Procedure**

On September 18, 2007 the attendees of the GRREC-sponsored workshop, “Kentucky Alternate Assessment Program Training,” were offered the opportunity to participate in the study by filling out the questionnaire. The potential participants were assured that their participation was voluntary and the results would be confidential, unless the participant chose to provide his or her name. The questionnaires were distributed to participants along with a cover letter describing the study in detail and covering the confidentiality issues. The attendees were directed to complete the survey at some point during the workshop and drop the completed questionnaire in a box on the premises. Those attendees who completed the survey were allowed to choose a piece of candy as a thank you.
The quantitative data from the questionnaire were entered into a SPSS spreadsheet. All questionnaire responses were then re-compared to the previously entered data to ensure accuracy of data entry before statistical analyses were completed. The participants' written responses addressing their concerns and difficulties were analyzed for theme and six theme categories were devised. Using those six themes, the participants' comments were then reviewed and coded by an independent graduate student in order to provide inter-rater reliability. An inter-rater agreement of 56% was obtained, which was considered unacceptable. Disagreements were discussed and refinements to the category definitions were made. The thesis author then recoded all responses.
Results

The primary purpose of this research was to evaluate special education teachers’ levels of training, knowledge, and current use of the specific interventions for students with ASD in order to better plan for continuing education needs of teachers in the GRREC area. Thus, most information from the survey will be presented using descriptive statistics. Two hypotheses were made regarding the impact the number of students with autism a teacher has taught and also the impact that teachers’ years of experience will have on their training, knowledge, and use of specific interventions. Those hypotheses were evaluated using Pearson correlations. The participants’ reports of concerns with any of the five instructional methods were subjected to a qualitative analysis for common themes. The theme categories that emerged were reported.

The participants were asked how many students with ASD that they are currently teaching and were asked to specify within a range of five how many students with ASD they have taught in their career. The mean number of students with ASD currently in the teachers’ classrooms was 2.19 ($SD = 3.1$) with a range of 0 to 25. Thirty-eight of the participants (41.8%) reported having one or two children with ASD in their class, and 25 of the participants (27.5%) currently had no students with ASD. At the extreme end of the range one participant reported currently teaching 25 students with ASD. The next highest number of students taught was eight. The outlier of 25 students, however, did not appear to inflate the overall mean as the median number of students taught was two. Over their careers in education, the total number of students with ASD taught by the participants ranged from one to over 21 students. The majority of the participants
(81.3%) stated that they have taught between one and ten students with ASD in their careers. The results are presented in Table 1.

The participants were asked to rate their levels of training, knowledge and use of the five interventions by using the qualitative descriptors of none, novice, intermediate, and proficient. The term 'none' was not used to assess their knowledge. The term novice described a limited awareness and/or a recent use of the instructional method. Intermediate referred to a good knowledge of instructional components and/or the use of the instructional method for about a year. Proficient referred to a strong knowledge of the instructional components and/or the long-term use of the instructional method. Table 2 reports the participants’ descriptions of their levels of training in the five instructional methods. The two methods of DTT and VSM received the highest percentage of respondents reporting no training in those methods (41.8% and 59.3%, respectively). The highest percentage of participants reporting a proficient level of training (16.5%) was with the Structured Teaching method.

The participants were asked to indicate their levels of knowledge of each of the five interventions. Table 3 reports these results. Most participants endorsed a novice level of knowledge with all of the instructional methods. Similar to the respondents’ reports on their levels of training, the Structured Teaching method had the highest percentage of teachers claiming proficient levels of knowledge. By the participants’ reports, it appears they were the least familiar with VSM as an intervention used with students with ASD.

The participants were also asked to describe their current levels of use of the five instructional methods. The results are in Table 4. Approximately half of the participants
Table 1

*Estimated Number of Students with ASD Taught During Entire Career*

<table>
<thead>
<tr>
<th>Number of ASD students</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td>1-5</td>
<td>53</td>
<td>58.2</td>
</tr>
<tr>
<td>6-10</td>
<td>21</td>
<td>23.1</td>
</tr>
<tr>
<td>11-15</td>
<td>7</td>
<td>7.7</td>
</tr>
<tr>
<td>16-20</td>
<td>3</td>
<td>3.3</td>
</tr>
<tr>
<td>21+</td>
<td>6</td>
<td>6.6</td>
</tr>
</tbody>
</table>

Table 2

*Levels of Training Reported for the Five Instructional Methods*

<table>
<thead>
<tr>
<th>Level</th>
<th>DTT</th>
<th>PECS</th>
<th>SocSt</th>
<th>StTch</th>
<th>VSM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>None</td>
<td>38 (41.8)</td>
<td>25 (27.5)</td>
<td>28 (30.8)</td>
<td>28 (30.8)</td>
<td>54 (59.3)</td>
</tr>
<tr>
<td>Novice</td>
<td>22 (24.2)</td>
<td>26 (28.6)</td>
<td>28 (30.8)</td>
<td>16 (17.6)</td>
<td>22 (24.2)</td>
</tr>
<tr>
<td>Intermediate</td>
<td>20 (22.0)</td>
<td>31 (33.0)</td>
<td>26 (28.6)</td>
<td>29 (31.9)</td>
<td>10 (11.0)</td>
</tr>
<tr>
<td>Proficient</td>
<td>8 (8.8)</td>
<td>7 (7.7)</td>
<td>5 (5.5)</td>
<td>15 (16.5)</td>
<td>1 (1.1)</td>
</tr>
</tbody>
</table>

*Note.* DTT = Discrete Trial Training; PECS = Picture Exchange Communication System; SocSt = Social Stories; StTch = Structured Teaching; VSM = Video Self-Modeling.
Table 3

*Levels of Knowledge for the Five Instructional Methods*

<table>
<thead>
<tr>
<th>Level</th>
<th>DTT</th>
<th>PECS</th>
<th>SocSt</th>
<th>StTch</th>
<th>VSM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novice</td>
<td>56 (61.5)</td>
<td>44 (48.4)</td>
<td>46 (50.5)</td>
<td>39 (42.9)</td>
<td>68 (74.7)</td>
</tr>
<tr>
<td>Intermediate</td>
<td>20 (22.0)</td>
<td>40 (44.0)</td>
<td>36 (39.6)</td>
<td>33 (36.3)</td>
<td>15 (16.5)</td>
</tr>
<tr>
<td>Proficient</td>
<td>9 (9.9)</td>
<td>8 (8.8)</td>
<td>5 (5.5)</td>
<td>15 (16.5)</td>
<td>2 (2.2)</td>
</tr>
</tbody>
</table>

*Note.* DTT = Discrete Trial Training; PECS = Picture Exchange Communication System; SocSt = Social Stories; StTch = Structured Teaching; VSM = Video Self-Modeling.

Table 4

*Participants’ Levels of Current Intervention Use*

<table>
<thead>
<tr>
<th>Level</th>
<th>DTT</th>
<th>PECS</th>
<th>SocSt</th>
<th>StTch</th>
<th>VSM</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>47 (51.6)</td>
<td>42 (46.2)</td>
<td>35 (38.5)</td>
<td>37 (40.7)</td>
<td>66 (72.5)</td>
</tr>
<tr>
<td>Novice</td>
<td>18 (19.8)</td>
<td>22 (24.2)</td>
<td>26 (28.6)</td>
<td>12 (13.2)</td>
<td>12 (13.2)</td>
</tr>
<tr>
<td>Intermediate</td>
<td>15 (16.5)</td>
<td>20 (22.0)</td>
<td>22 (24.2)</td>
<td>25 (27.5)</td>
<td>5 (5.5)</td>
</tr>
<tr>
<td>Proficient</td>
<td>6 (6.6)</td>
<td>5 (5.5)</td>
<td>4 (4.4)</td>
<td>14 (15.4)</td>
<td>1 (1.1)</td>
</tr>
</tbody>
</table>

*Note.* DTT = Discrete Trial Training; PECS = Picture Exchange Communication System; SocSt = Social Stories; StTch = Structured Teaching; VSM = Video Self-Modeling.
do not use the DTT or PECS methods. Approximately 40% of the participants do not use Social Stories or Structured Teaching methods. Almost three-fourths of the teachers do not use Video-Self Modeling. Structured Teaching was reported as being used the most with 42.9% of the teachers indicating an Intermediate or Proficient level of use.

Caveland Educational Support Center personnel were interested in any previous training the participants had attended and their perceived need for training in the five intervention approaches. Table 5 shows where the participants received previous training. Only the participants who reported receiving training are listed. The participants who indicated no training were not reported in the table; therefore, the total number of participants varies between the intervention types. The greatest percentage of participants reported receiving training from their local educational cooperative in all of the instructional methods.

Table 6 reports what type of interventions the participants are interested in receiving training in and at what levels of training. The possible levels of training included no training, orientation (covering a basic knowledge of the intervention), implementation (wanting assistance in using the intervention in the classroom), and refinement (assistance with improving effectiveness of utilizing the method). At the implementation level, the highest percentage of teachers indicated an interest in PECS training (36.3%). The greatest percentage of respondents who wanted assistance at the refinement level indicated the Structured Teaching method (27.5%). Of all the interventions, participants expressed the least interest in being trained with VSM (24.2%).
Table 5

*Training Providers for the Five Instructional Methods*

<table>
<thead>
<tr>
<th>Provider</th>
<th>DTT</th>
<th>PECS</th>
<th>SocSt</th>
<th>StTch</th>
<th>VSM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provider</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Local School</td>
<td>13 (14.3)</td>
<td>16 (17.6)</td>
<td>16 (17.6)</td>
<td>15 (16.5)</td>
<td>8 (8.8)</td>
</tr>
<tr>
<td>Local Coop.</td>
<td>23 (25.3)</td>
<td>24 (26.4)</td>
<td>22 (24.2)</td>
<td>30 (33.0)</td>
<td>10 (11.1)</td>
</tr>
<tr>
<td>Other</td>
<td>11 (12.1)</td>
<td>18 (19.8)</td>
<td>16 (16.6)</td>
<td>16 (12.1)</td>
<td>8 (8.8)</td>
</tr>
</tbody>
</table>

*Note.* DTT = Discrete Trial Training; PECS = Picture Exchange Communication System; SocSt = Social Stories; StTch = Structured Teaching; VSM = Video Self-Modeling.

Table 6

*Level of Intervention Training Desired by Participants*

<table>
<thead>
<tr>
<th>Level</th>
<th>DTT</th>
<th>PECS</th>
<th>SocSt</th>
<th>StTch</th>
<th>VSM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>None</td>
<td>21 (23.1)</td>
<td>21 (23.1)</td>
<td>17 (18.7)</td>
<td>19 (20.9)</td>
<td>22 (24.2)</td>
</tr>
<tr>
<td>Orientation</td>
<td>21 (23.1)</td>
<td>13 (14.3)</td>
<td>20 (22.0)</td>
<td>19 (20.9)</td>
<td>31 (34.1)</td>
</tr>
<tr>
<td>Implementation</td>
<td>26 (28.6)</td>
<td>33 (36.3)</td>
<td>28 (30.8)</td>
<td>19 (20.9)</td>
<td>21 (23.1)</td>
</tr>
<tr>
<td>Refinement</td>
<td>14 (15.4)</td>
<td>16 (17.6)</td>
<td>15 (16.5)</td>
<td>25 (27.5)</td>
<td>9 (9.9)</td>
</tr>
</tbody>
</table>

*Note.* DTT = Discrete Trial Training; PECS = Picture Exchange Communication System; SocSt = Social Stories; StTch = Structured Teaching; VSM = Video Self-Modeling.
One of the research hypotheses was that the teachers’ years of experience would have no relationship to the levels of training, knowledge, and current use of the different instructional methods. A Pearson $r$ correlation was used to examine the relationship between the participants’ years of teaching special education and the reported levels of training, knowledge, and current use of all of the five types of interventions. The results are in Table 7, and were non-significant in all of the areas. These results support the hypothesis that special education teachers’ years of teaching are not a determining factor in their expertise in and use of research-based interventions.

The other research hypothesis was that the total number of students a teacher has taught throughout his or her career is related to the reported levels of training, knowledge, and current use of the five interventions. A Pearson $r$ correlation was used to examine the relationship between the total number of students with ASD that a participants reported teaching in their educational career, and their levels of training, knowledge, and current use of all of the interventions. These results are reported in Table 8. The total number of students taught and the levels of training were significantly correlated for the Structured Teaching and VSM models. The level of knowledge was significantly correlated with the number of students taught only for the Structured Teaching method. The total number of students with ASD taught and the level of current use was significantly correlated for the PECS, Social Stories and Structured Teaching interventions. In summary, the total number of students taught was significantly correlated to teachers’ reported levels of training, knowledge, and current use of the Structured Teaching method. There were no significant correlations between the number of students taught and the DTT intervention.
Table 7

*Correlations Between Years of Special Education Experience, the Methods, and the Levels of Training, Knowledge, and Current Use*

<table>
<thead>
<tr>
<th>Instructional Method</th>
<th>Level of Training</th>
<th>Level of Knowledge</th>
<th>Level of Current Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discrete Trial Training</td>
<td>.09</td>
<td>.09</td>
<td>.01</td>
</tr>
<tr>
<td>Picture Exchange Comm. System</td>
<td>.12</td>
<td>.05</td>
<td>.17</td>
</tr>
<tr>
<td>Social Stories</td>
<td>.14</td>
<td>.12</td>
<td>.17</td>
</tr>
<tr>
<td>Structured Teaching</td>
<td>.04</td>
<td>.03</td>
<td>-.08</td>
</tr>
<tr>
<td>Video Self-Modeling</td>
<td>.08</td>
<td>.07</td>
<td>-.09</td>
</tr>
</tbody>
</table>

*Note.* No correlations were significant at the *p* < .05 level.
Table 8

*Correlations Between Total Number of Students Taught, the Methods, and the Levels of Training, Knowledge, and Current Use*

<table>
<thead>
<tr>
<th>Instructional Method</th>
<th>Level of Training</th>
<th>Level of Knowledge</th>
<th>Level of Current Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTT</td>
<td>.15</td>
<td>.08</td>
<td>.17</td>
</tr>
<tr>
<td>PECS</td>
<td>.21</td>
<td>.20</td>
<td>.29**</td>
</tr>
<tr>
<td>SocSt</td>
<td>.21</td>
<td>.16</td>
<td>.38***</td>
</tr>
<tr>
<td>StTch</td>
<td>.27*</td>
<td>.26*</td>
<td>.31**</td>
</tr>
<tr>
<td>VSM</td>
<td>.27*</td>
<td>.07</td>
<td>.16</td>
</tr>
</tbody>
</table>

*Note.* DTT = Discrete Trial Training; PECS = Picture Exchange Communication System; SocSt = Social Stories; StTch = Structured Teaching; VSM = Video Self-Modeling.

*p < .05. **p < .01. ***p < .001*
The participants were given the opportunity to provide written feedback about concerns and difficulties with any or all of the instructional methods. A list of all the comments is found in Appendix C. The feedback was evaluated for common themes and six general categories were developed from examining the comments in all types of interventions. All of these categories were present in comments regarding at least two or more of the different intervention methods. Table 9 reports the number of comments made in each category for all five of the interventions.

One category that was found in comments from all five interventions was the need for training in the intervention. Statements such as “need training” or “have used but would like to know how and techniques” were characteristic of this category. In addition, some comments were specific to the method like “need help in PECS program on the computer.”

A second category that emerged concerned the complexity of the instructional technique and this encompassed areas such as the time required, the technology needed, and a perception of an increased level of difficulty with the instructional method. Problems with increased paperwork or lack of parental implementation were also part of this category. Comments from the different instructional methods that fell into this category were “lots of prep time,” “technology phobia,” “too much paperwork,” and “concern-parental implementation system at home.” Comments from all five instructional methods fell into this category.

The additional cost to implement, or need of resources emerged as a third category. One comment concerned the lack of space available in the classroom, while
### Table 9

**Number of General Comment Categories for Interventions**

<table>
<thead>
<tr>
<th>Comment</th>
<th>DTT</th>
<th>PECS</th>
<th>SocSt</th>
<th>StTch</th>
<th>VSM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
<td>n</td>
<td>n</td>
<td>n</td>
<td>n</td>
<td>n</td>
</tr>
<tr>
<td>Training need</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Complexity</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Cost/resources</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Implementation</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Impressions</td>
<td>1</td>
<td>6</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Staffing needs</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Note.* DTT = Discrete Trial Training; PECS = Picture Exchange Communication System; SocSt = Social Stories; StTch = Structured Teaching; VSM = Video Self-Modeling.

Another stated that technological equipment was not available. One comment simply stated, "costs."

Difficulty in implementing the instructional technique was mentioned as another concern and became a fourth category. Statements such as "I am having a difficult time getting him to use pictures to communicate," or "I’ve been to training, haven’t implemented it as well as I hoped to" illustrate the concerns that fall into this category.

Some of the respondents just stated their impressions of a specific technique or made a general comment about the intervention, a fifth category. For instance, "not the greatest for all students, but for some is great. Can be boring and monotonous," or "good
start for lots of students” were some of the comments made about different instructional methods. A general statement about the PECS method was that “students were using regularly for various purposes.”

Another general category that emerged was the need for additional staff in order to implement the intervention. While this could have been included in the cost or resource category, statements such as “need more staff,” or “requires an in-district program manager ‘expert’ in order to be utilized fully” seemed to indicate a specific need; therefore, it is considered a separate category.

The majority of comments dealt with the need for additional training or a method’s complexity. Participants’ impressions of DTT were characterized by comments such as “lack of individual time (available) with students,” or “requires an in-district program manager expert to really be utilized fully.” The greatest number of written comments was targeted toward PECS. A concern specific only to PECS, that of implementation of the technique in the home setting, was discovered. Of the multiple comments regarding home implementation the concern is summarized by one statement, “We have discovered a lack of implementation at home even when the parents strongly request its use at school.” The fewest comments were made about Social Stories with one exceptionally positive comment of, “great! Love them.” Structured Teaching comments indicated a number of concerns with “lots of prep time (needed),” and a desire for follow-up training. The concerns with VSM focused on the need for time and technological capabilities.

One response was not intervention specific and was written at the bottom of the questionnaire. It expressed a desire for general education in the area of ASD. This
response stated, “advanced training in the psychology of behavior and the complex behavioral patterns and challenges seen in teaching students with autism is a real need in our area.” Such a comment indicates that, despite more research and general information available concerning autism, at least one teacher thinks the need to educate special education teachers continues.
Discussion

Despite an increased awareness of autism and a greater prevalence of diagnosis, many unknowns still exist in the education system when providing instruction to students with ASD. There is a lack of consensus on what constitutes effective educational interventions for students with ASD (Kasari, 2002), educators are left to their own devices when choosing interventions, and the actual use of research-based interventions in the school setting is unclear. In a recent study, Stahmer et al. (2005) reported that Early Intervention professionals combined and modified evidence-based treatment techniques when providing treatment to children with ASD. Stahmer et al. indicated the need to expand the study to different service providers to get a more encompassing picture of the intervention methods used by those instructing children with ASD.

This study sought to further examine how service providers work with children with ASD by studying special education teachers in the public school setting. The primary intent of this study was to gather information for a special education cooperative to help plan future continuing education workshops for special education teachers in this area. This study examined special education providers’ level of training, knowledge, and current use of five research-based intervention methods targeted towards students with ASD.

Prior to conducting the research, two hypotheses were made regarding whether a relationship existed between special education teachers’ levels of training, knowledge, and current use of the instructional methods with their years of experience teaching children with ASD and the number of students with ASD the teachers have taught. As predicted, the results indicated that special education teachers’ years of experience were
not related to their training, knowledge, or current use of interventions targeted towards students with ASD. It appears that additional years of working in the special education setting alone does not mean the teacher will be any more knowledgeable or likely to use a specific intervention method for children with ASD. The majority of the teachers reported little knowledge of different instructional methods. Autism is a specialized field and requires an effort to obtain and use specialized instructional methods. Special education teachers work with children with a variety of disabilities and do not necessarily have the specific training in instructional methods related to autism, particularly at the pre-service level.

It was predicted that the number of students with ASD a teacher has worked with would be related to the teachers’ levels of training, knowledge and current use of the instructional methods. This hypothesis was partially supported by the results. There was a significant correlation between participants’ levels of training in Structured Teaching and VSM with the number of students taught, but not for training in the other interventions. It is not clear why training in only those methods was correlated with total number of students taught. Perhaps there is a greater availability of continuing education in those methods or a recent training in those methods occurred in the area.

There was only one significant correlation between the number of students taught and the teachers’ levels of knowledge and that was with Structured Teaching. Structured Teaching is an intervention that lends itself to working with groups of students and it may be that teachers with a larger number of students with ASD seek training in an intervention that works well for a class of students, not just an individual. It is possible that there have been more continuing education workshops available on Structured
Teaching than other methods and those teachers who have taught more children with autism have sought out such workshops.

The participants’ levels of current use of PECS, Social Stories, and Structured Teaching were significantly correlated to the total number of students taught. However, there was no significant correlation between the number of students taught and the instructional methods of DTT or VSM. The lack of relation with VSM and DTT may be due to fewer participants reporting current use of the methods, or perhaps it is related to fewer participants receiving training in the methods, or the fact that more participants stated their knowledge was at the novice level with those interventions.

This study found some indications that special education teachers’ awareness of research-based interventions for students with ASD is not related to length of experience, but to a greater contact or involvement with such a student population. According to the Centers for Disease Control and Prevention (2007) the autism prevalence rate has increased and educators can expect more students diagnosed with ASD to be present in their classrooms in the future. The initial findings of this study are that special education teachers’ knowledge, training and use of research-based instructional methods are somewhat related to the amount of contact they have with students with ASD, but only with some interventions. To serve the students better, teachers need increased exposure to and training in methods that work with children with ASD.

The information gained for future training purposes indicated many participants’ desire for further training. The responses to the question on level of training desired, however, did not indicate a clear direction for future training. In the methods of DTT, PECS, and Social Stories the greatest number of respondents desired training at the
implementation level. For Structured Teaching, respondents were evenly divided between desiring no further training and training at the orientation and implementation levels. For VSM, the greatest number of respondents desired an orientation to the method. In addition, although many respondents reported a lack of training in the various instructional methods and very few respondents indicated proficiency with the methods, a large percentage of respondents (between 19% and 24%, depending on the method) indicated that they did not desire any training at all. It appears the need for training exists at all the different levels and for all of the intervention methods.

Limitations

A number of limitations are noted in the present study. The participants were a self-selected sample of teachers attending a training workshop. The special education teachers who responded and participated may be more concerned with students with ASD than a typical group of educators, or a greater percentage of them may have already received training in the interventions. Also, all participants were from a local educational cooperative in middle Kentucky. Because of these factors, the results are limited for any type of generalization beyond the immediate sample characteristics.

The questionnaire was devised to be a self-report measure and the idea of reporting on one’s own level of training, knowledge, or current use of interventions may produce somewhat biased results. In addition, not all of the five interventions represented in the study may have been familiar to the participants. While the questionnaire did have a description of each intervention method, it is possible that participants may not be aware of the complexity of a specific intervention, and think that they are utilizing a strategy correctly. They may not, however, be performing the
intervention as intended and there may be issues of fidelity in their use of the method. So a question exists as to whether the teachers who reported using an instructional method were in fact using the method as intended.

The qualitative analysis of participants’ comments included an inter-rater reliability check; however, 100% agreement did not occur. After the check, the responses that were not placed in the same category by both raters were discussed and category descriptions were made more specific. A second inter-rater reliability check on specific comments was not performed, but may have helped to solidify the categories and the precise number of comments made in each.

In order to provide Caveland Educational Support Center with valuable and pertinent information on training needs of teachers in this area, this questionnaire combined multiple issues of training, knowledge, and current use of the five research-based interventions. It may have been better to address to these issues separately, eliminating any possible confusion among areas. Studying each area separately, and in more depth, may have produced a clearer picture of the training needs of special education teachers in the Caveland region.

Implications

As evidenced by the participants’ responses, a standard knowledge base of evidence-based autism interventions is not universal. Further research into the interventions that special education teachers choose to use, along with the reasons why, could help school systems plan for training in order to bring the research-based interventions to the school setting. Many teachers also expressed a need for training and help implementing the interventions in the classroom. This was expressed directly in
answering questions about desired training, and also indirectly, by admitting a lack of
knowledge and training in the interventions of DTT, PECS, Social Stories, Structured
Teaching, and VSM. However, a curious finding was that one-fourth to one-fifth of the
teachers desired no additional training on the instructional methods. Future research may
want to examine the reasons why so many teachers have no interest in learning about
specific instructional techniques.

The fact that these special education teachers were likely to have more training,
knowledge, or use of the interventions based on increased exposure with children with
ASD is a promising sign. It seems to indicate a teacher response based on the perceived
needs of the students. With more children being identified with ASD, a greater need
arises for some level of expertise in order to benefit the student with ASD in the school
setting. It is vitally important to have special education teachers with knowledge and
experience of autism interventions instructing students with ASD. Future research may
be needed to examine how to best translate teachers’ knowledge and training about
specific autism interventions into practice. Furthermore, the fidelity of the interventions
implemented by teachers is another area in need of future research.
References


prelinguistic communication interventions on the acquisition of spoken
communication in preschoolers with ASD. *Journal of Speech, Language, and
Hearing Research, 49*, 698-711.
Appendix A

Human Subjects Review Board Approval
Dear Dawn:

Your revision to your research project, “An evaluation and needs-based assessment of special education teachers’ knowledge of autism interventions,” was reviewed by the HSRB and it has been determined that risks to subjects are: (1) minimized and reasonable; and that (2) research procedures are consistent with a sound research design and do not expose the subjects to unnecessary risk. Reviewers determined that: (1) benefits to subjects are considered along with the importance of the topic and that outcomes are reasonable; (2) selection of subjects is equitable; and (3) the purposes of the research and the research setting is amenable to subjects’ welfare and producing desired outcomes; that indications of coercion or prejudice are absent, and that participation is clearly voluntary.

1. In addition, the IRB found that you need to orient participants as follows: (1) signed informed consent is not required as participation will imply consent; (2) Provision is made for collecting, using and storing data in a manner that protects the safety and privacy of the subjects and the confidentiality of the data. (3) Appropriate safeguards are included to protect the rights and welfare of the subjects.

This project is therefore approved at the Expedited Review Level until December 31, 2007

2. Please note that the institution is not responsible for any actions regarding this protocol before approval. If you expand the project at a later date to use other instruments please re-apply. Copies of your request for human subjects review, your application, and this approval, are maintained in the Office of Sponsored Programs at the above address. Please report any changes to this approved protocol to this office.

Sincerely,

Sean Rubino, M.P.A.
Compliance Manager
Office of Sponsored Programs
Western Kentucky University

cc: HS file number Richardson HS07-179
Appendix B

Autism Instructional Techniques Needs Assessment
Autism Instructional Techniques Needs Assessment

The purpose of this questionnaire is to identify the training needs of teachers who serve children with Autism Spectrum Disorder in the region. The information gathered here is for planning purposes only and will not be used in any type of personal evaluation of your skills. Please answer all questions as accurately as possible.

Demographic Questions:

1. Name (optional): ____________________________

2. School District: ____________________________

3. Building (optional): ____________________________

4. Specify the type of classroom in which you teach (e.g., resource, FMD, EBD).
   ____________________________

5. What grade level(s) do you teach? ____________________________

6. How many years (including this one) have you been teaching special education? _____

7. How many years total (including this one) have you been teaching? _____________

8. What is your highest level of education (circle one)?
   Bachelors   Masters   Other: (specify) ____________________________

9. How many children with an Autism Spectrum Disorder (e.g., Autism, PDD-NOS, Asperger’s) do you currently teach? _____________

10. Estimate how many children with an Autism Spectrum Disorder (ASD) you have worked with in your career as a teacher (circle one).
    0   1-5   6-10   11-15   16-20   21+
You will be asked about five instructional methods commonly used for students with autism. The instructional methods are defined as follows:

*Discrete Trial Teaching (DTT) is a specific instructional method based upon Applied Behavior Analysis principles. DTT involves breaking a skill into smaller parts and teaching one sub-skill at a time until mastery, allowing repeated practice in a concentrated period of time, providing prompting and prompt fading as necessary, setting an appropriate pace of instruction and using correction and reinforcement procedures.

*Picture Exchange Communication System (PECS) teaches children with autism to initiate meaningful, expressive communication by exchanging a picture for the desired object or activity. PECS is highly structured and a 6-step process.

*Social Stories is the use of an individualized story written for a specific child and social situation in positive terms. The social story describes the situation, skill, or concept in terms of relevant social cues, perspectives and common responses in a specifically defined style and format. Social Stories are written with four types of sentences: descriptive, perspective, directive, and affirmative. Implementing Social Stories also requires knowledge of how and when to use the stories.

*Structured Teaching is a method of instruction based upon the TEACCH (Treatment and Education of Autistic and related Communication handicapped Children) approach. The components of structured teaching consist of clear physical and visual boundaries, daily visual schedules, work systems, and visual structure of activities through jigs.

*Video Self-Modeling (VSM) is an instructional method in which the child is videotaped while engaged in a sequence of tasks toward a goal or target behavior. The tape is edited to remove all prompts by the teacher and mistakes made by the child. Then the child is provided the opportunity to view him or herself in the video as a learning opportunity providing a model for learning the target behavior.

11. Please circle where you have received training on the following instructional methods, if applicable:

<table>
<thead>
<tr>
<th>Instructional Method</th>
<th>None</th>
<th>Local School Staff</th>
<th>Local Special Educ. Coop.</th>
<th>Other (specify)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discrete Trial Training</td>
<td>None</td>
<td>Local School Staff</td>
<td>Local Special Educ. Coop.</td>
<td>Other (specify)</td>
</tr>
<tr>
<td>PECS</td>
<td>None</td>
<td>Local School Staff</td>
<td>Local Special Educ. Coop.</td>
<td>Other (specify)</td>
</tr>
<tr>
<td>Social Stories</td>
<td>None</td>
<td>Local School Staff</td>
<td>Local Special Educ. Coop.</td>
<td>Other (specify)</td>
</tr>
<tr>
<td>Structured Teaching</td>
<td>None</td>
<td>Local School Staff</td>
<td>Local Special Educ. Coop.</td>
<td>Other (specify)</td>
</tr>
<tr>
<td>Video Self-Modeling</td>
<td>None</td>
<td>Local School Staff</td>
<td>Local Special Educ. Coop.</td>
<td>Other (specify)</td>
</tr>
</tbody>
</table>
For the next part of the survey, response choices of Novice, Intermediate and Proficient are defined as follows:

**Novice** - refers to limited awareness and/or only recently beginning to use an instructional method.

**Intermediate** - refers to a good knowledge of the instructional components and/or the use of an instructional method for about a year or so.

**Proficient** - refers to a strong knowledge about the instructional components and/or the long-term use of the instructional method.

12. Please circle the level of training you have received on the following instructional methods.

<table>
<thead>
<tr>
<th>Instructional Method</th>
<th>None</th>
<th>Novice</th>
<th>Intermediate</th>
<th>Proficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discrete Trial Training</td>
<td></td>
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<td></td>
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<tr>
<td>PECS</td>
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<tr>
<td>Social Stories</td>
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</tr>
<tr>
<td>Structured Teaching</td>
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<td></td>
</tr>
<tr>
<td>Video Self-Modeling</td>
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</tr>
</tbody>
</table>

13. Please circle your level of knowledge of the following instructional methods:

<table>
<thead>
<tr>
<th>Instructional Method</th>
<th>Novice</th>
<th>Intermediate</th>
<th>Proficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discrete Trial Training</td>
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<tr>
<td>PECS</td>
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<tr>
<td>Social Stories</td>
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<tr>
<td>Structured Teaching</td>
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<tr>
<td>Video Self-Modeling</td>
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</table>

14. Please circle your level of current use of the following instructional methods:

<table>
<thead>
<tr>
<th>Instructional Method</th>
<th>None</th>
<th>Novice</th>
<th>Intermediate</th>
<th>Proficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discrete Trial Training</td>
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<td>PECS</td>
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<td>Social Stories</td>
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<tr>
<td>Structured Teaching</td>
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<tr>
<td>Video Self-Modeling</td>
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</table>
For question #15, use the following scale:

None – No training with the instructional method is desired.

Orientation/Awareness – desire basic knowledge of the instructional method.

Implementation – desire assistance with implementing the method in my classroom.

Refinement – desire assistance with enhancing my effectiveness in the utilization of the method in my classroom.

15. Please circle the level of additional training/assistance you would like to receive on the following instructional methods:

<table>
<thead>
<tr>
<th>Instructional Method</th>
<th>None</th>
<th>Orientation</th>
<th>Implementation</th>
<th>Refinement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discrete Trial Training</td>
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<tr>
<td>Structured Teaching</td>
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<tr>
<td>Video Self-Modeling</td>
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</tbody>
</table>

16. Please describe any concerns or difficulties you have about specific aspects of each instructional method based on what you know about it or based on your attempts to implement the technique. You may also describe general concerns (e.g., amount of preparation time required, lack of parent or administrator support of method).

Discrete Trial Training -

PECS -

Social Stories -

Structured Teaching -

Video Self-Modeling -

Thank you for taking the time to answer this questionnaire!
Appendix C

Participant Comments Regarding Instructional Techniques
Discrete Trial Training
- Not the greatest for all students, but for some is great. Can be boring and monotonous. (But I guess that is the idea!)
- Doing fine, but could do better.
- Need training.
- Need more staff to implement!
- Too much time on paperwork. Too many rules to make it work. The student I have does not have a one-on-one assistance, but to do DDT it takes one-on-one assistance.
- Time consuming other students distracted due to limited room space.
- Must have specific training.
- Lack of individual time with students.
- Requires an in-district program manager “expert” to really be utilized fully.
- This training would be more beneficial with some follow-up training time offered to handle application questions once teachers are trying these strategies in their classrooms.

PECS
- Concern – parental implementing system at home.
- We have discovered a lack of implementation at home even when the parents strongly request its use at school.
- Time required to update libraries of words.
- Students using regularly for various purposes.
- Good start for lots of students. (part 1 of 2 part comment)
- Sort of time consuming to hunt pictures, but that’s just how it is I guess! (part 2 of 2 part comment)
- One child is non-verbal, I need help using boardmaker; need help in (signing simple words) PECS program on the computer. She has taught me, but to add more vocabulary (hers and mine).
- Need training.
- I have an autistic student who indicates with a verbalization (uh) and hand gesture that he wants his coke at lunch time. The only other communication he has with the adults in the class is making a choice of his reward using pictures, when he finishes his work. (part 1 of 2 part comment)
- I am having a difficult time getting him to use pictures to communicate otherwise. (part 2 of 2 part comment)
- Don’t think it’s realistic. My kids do not use this at home. However, it has been successful in classroom setting.
- Prep time- doesn’t seem applicable to all students; more one-to-one instruction.
- How important is it to use if student can show you or get what they want.
- When I have used it in the past with autistic student he would use instead of speaking. When I stopped using it he began talking to communicate.
- Moving past picture id/choice into sentences, phrases, questions, and commenting.
- Want to use more; unsure of how to get resources.
- Lack of support.
- Costs?
Social Stories
-Great! Love them. (part 1 of 2 part comment)
-Wish there were more pre-made stories. We write our own as needed, but would be easier if already made. (part 2 of 2 part comment)
-I’ve been to a training, haven’t implemented it as well as I hoped to.
-Need training.
-Lack of prep time.
-Have used but would like to know how and techniques.

Structured Teaching
-Lots of prep time – so structured that upset my student when we HAD to make a change in schedule.
-Not familiar with.
-Fine.
-Need training.
-No concerns.
-Creation time and how to bump up to next level without creating all new folders. Would love to have a “packet” available to purchase core content—2/3 level Dim. A or Dim. B (ready made tasks for sale).
-Lack of prep time.
-Lack of time/planning.
-Room – my classroom is too small.
-Amount of prep and buy in.
-Amount of preparation time.
-This training would be more beneficial with some follow-up training time offered to handle application questions once teachers are trying these strategies in their classrooms.

Video Self-Modeling
-Time.
-Time consuming.
-Speech therapist has just started with one of my students.
-Need help implementing.
-Need training.
-Not very familiar with.
-Technology phobia.
-New idea to me.
-Time and equipment available do not have video-DVD or computer that can handle video editing yet!
-Too time consuming before, DURING, and after school especially with a full caseload. What are you supposed to do with the other students?
-Lack of technological know how.
-Lack of time/planning.
-Editing.