THE USE OF VISUAL SUPPORTS FOR STUDENTS WITH AUTISM

IN INCLUSIVE PHYSICAL EDUCATION

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THE USE OF VISUAL SUPPORTS FOR STUDENTS WITH AUTISM IN INCLUSIVE PHYSICAL EDUCATION

Jeanine Fittipaldi-Wert

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VITA

Jeanine Fittipaldi-Wert, daughter of Domenico and Angeline Fittipaldi, was born on November 11, 1973 in Philadelphia, P.A. Jeanine grew up outside of Philadelphia, P.A. and graduated from Upper Dublin High School in 1991. She completed her Bachelor of Science with Honors in Health and Physical Education Teacher Education at West Chester University, P.A. in 2001. Jeanine taught at Pennfield Middle School for 2 years and coached soccer, basketball, and lacrosse. She attended SUNY Brockport, N.Y. and completed her Master of Science in Education, Adapted Physical education in 2004. In 2004, Jeanine began pursuing a Doctor of Philosophy degree in Physical Education – Pedagogy with a specialization in working with children and adults with disabilities Auburn University.

DISSERTATION ABSTRACT

THE USE OF VISUAL SUPPORTS FOR STUDENTS WITH AUTISM

IN INCLUSIVE PHYSICAL EDUCATION

Jeanine Fittipaldi-Wert

Doctor of Philosophy, August 4, 2007
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(B.S., West Chester University, 2001)

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The purposes of this study were: (1) to examine the effects of visual supports on individuals with autism time-on-task behavior in inclusive physical education, (2) to examine the effects of visual supports on individuals with autism time-off-task behavior in inclusive physical education, and (3) to examine the effects of visual supports on individuals with autism assisted task behavior in inclusive physical education.

A single subject delayed multiple baseline design across 4 participants with autism (3 boys and 1girl) ages 5-9 was used. The study included 7 – 12 sessions of baseline, 11 sessions of intervention, and 3 sessions of maintenance.

The visual supports were implemented during physical education sessions. Visual supports included pictures, line drawings, visual activity schedules, spots and lines on the floor, timers, written schedules, and specific boundaries.

The dependent variables were the participant's percentage of time-on-task, time-of-task, or assisted task in inclusive physical education as measured by the Behavior Evaluation Strategy and Taxonomy (BEST: Sharpe & Koperwas, 1999).

Results indicated the use of visual supports in inclusive physical education for students with autism increased time-on-task from 36.70% to 63.40%, time-off-task decreased from 29.88% to 15.23%, and assisted task behaviors decreased from 33.43% to 21.39%.

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I want to dedicate this to my grandparents and Greg. I DID IT! Nana, thank you for being such a tremendous influence on me. You are one of the strongest women I have ever known! Greg, thank-you! Thank you for the unconditional support and belief in me.

I want to thank my family. My Parents, Dominick, Maria & Dave, Little David & Christina, Aunt Rita, Aunt Connie & Uncle Mike, and Mom & Dad Wert for your consistent love, support, and belief in me!

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CHAPTER I

INTRODUCTION

You are standing in a room hearing people talking and yelling, their voices echoing, florescent lights buzzing, basketballs bouncing, sneakers screeching on the gymnasium floor and you are hearing this all at once. At the same time, you see cones and various equipment scattered on the floor, basketballs moving in the air, people moving and stopping, and to add to it your clothes are itching you and feel heavy on your body. Welcome to the day in the life of a student with autism in physical education.

According to the Department of Health and Human Services Centers for Disease Control and Prevention (2007), the prevalence of Autism Spectrum Disorder (ASD) is 1 in 150, making autism the fastest growing developmental disability in the United States. Within the past decade, school districts have been faced with inclusion due to the laws supporting education of all students and the increase in number of students with disabilities. Laws such as The Rehabilitation Act of 1973, Individuals with Disabilities Education Act (IDEA) of 1990, and No Child Left Behind Act (NCLB) of 2001 support inclusion of students with disabilities in regular education environments with the right to appropriate support services in the least restricted environment (Winnick, 2005). The increase in the prevalence of autism and the laws supporting education for students with disabilities makes it very likely for educators to teach several students with autism during their career. However, research has indicated teachers feel they have not received

adequate training in teaching students with disabilities, particularly students with autism, and they have not received all the resources needed to meet the needs of all students in an inclusive setting (Block, 2003; LaMaster, Gall, Kinchin, & Siedentop, 1998; Lienert, Sherrill, & Myers, 2001). Therefore, teachers are faced with the challenge of how to successfully teach in an inclusive physical education environment. This paper focuses specifically on teaching students with autism in an inclusive physical education class.

In order to facilitate learning and create a positive educational environment, it would be beneficial for teachers to have an understanding of autism and the characteristics of children with autism (Mesibov & Shea, 1996). Children with autism have trouble understanding what to do and when to do it due to deficits in communication which causes anxiety and confusion. This then causes withdrawal and disruptive and self-stimulatory behaviors (American Psychiatric Association, (APA) 2000; Collier & Reid, 2003; Jones & Block, 2006; Mesibov & Shea, 1996). Characteristics of children with autism are deficits in social interaction and communication, and restrictive, repetitive, and stereotypical behaviors (APA, 2000).

Characteristics of children with autism that present challenges to physical educators are: the absence or minimal demonstration of cooperative play, failure to develop peer relationships appropriate to the student's developmental level, hypersensitivity to light or electronic buzzing, desire for sameness, nonverbal or minimal speech, and preoccupation with one or more stereotyped and restricted patterns of interest. Also, students with autism have difficulty comprehending spoken language, understanding orderly systems and relationships, and time, but process visual information more easily than auditory stimuli (Quill, 1995; Schopler, Mesibov, & Hearsey, 1995).

Theses characteristics of a student with autism present challenges to physical educators for a variety of reasons. Depending on the demographic location of a school, an average physical education class ranges from 30 – 100 students. Therefore, physical educators plan tasks that involve students cooperatively working in pairs and in small or large groups. This environment does not facilitate learning for a student with autism due to their absence or minimal demonstration of cooperative play and failure to develop peer relationships appropriate to the student's developmental level (Schultheis, Boswell, & Decker, 2000). Also, the physical education environment can be a place of chaos to a student with autism due to their hypersensitivity to light and the inability to habituate electronic buzzing noises from the fluorescent lights; consequently, there are also 30 - 100 peers moving simultaneously and various pieces of equipment visible all in a large open area. The physical education environment is constantly changing; for example, the task itself, the equipment being used, or the formation of students (individual to partners to small groups and sometimes to large groups). These changes conflict with a student with autisms need for sameness, predictability, and a possible preoccupation with one or more stereotyped and restricted patterns of interest.

Communication is important in any teaching area. Physical educators relay on verbal communication to explain and demonstrate a new task and provide students with feedback. In turn, to provide assistance to a task or activity, physical educators rely on students' verbal feedback. However, students with autism may be nonverbal or have minimal speech and have difficulty comprehending the spoken language. Therefore, verbal explanations are not the most productive method of conveying information to a student with autism (Mesibov & Shea, 1996).

In planning an organized lesson, some physical educators use colors and numbers to advise students where to go or what is next. For example, stations in numerical order to notify students they are to go to the next numbered station on a cue. However, some students with ASD have difficulty comprehending the organizational use of numbers. For example if they are at Station 2, they will not automatically go to Station 3 unless shown a number 3 task card to match to the number 3 at the station. Some students with ASD interpret the numbering system as only nominal instead of ordinal which defines a specific sequence. Physical educators are also notorious for advising students they have a certain amount of time to complete an activity however, using a timer would be a more efficient method for a student with ASD to provide a visual that indicates it is time to stop a specific task. It must be noted that all of these organizational strategies used by physical educators may not facilitate learning for a student with autism as they have difficulty understanding systems and orderly relationships, and process visual information more efficiently than auditory information (Quill, 1995; Schopler, Mesibov, & Hearsey, 1995).

Although the characteristics mentioned present challenges to physical educators, physical educators are to facilitate learning for all students (Schultheis, Boswell, & Decker, 2000). Furthermore, physical educators teach 30 -100 students involved simultaneously in an activity and all of those students have various levels of abilities. Therefore, physical educators are constantly faced with the challenges of meeting the needs of students. In meeting the needs of students with autism, it must be noted that they process visual information more efficiently compared to auditory information and no two students with autism are the same.

Research conducted in classroom settings indicate positive findings for the use of visual supports in acquiring skills, increasing social interactions, and decreasing off task behaviors (Coucouvanis, 1997; Krantz & McClannahan, 1993; Dettmer, Simpson, Myles, & Ganz, 2000). Visual supports aid in maintaining attention, sequencing and organizing the environment, and preparing students for an activity (Hodgdon, 1995; Odom, Brow, Frey, Karasu, Smith- Canter, Strain, 2003; Quill, 1995).

Due to the unique characteristics of students with autism, a variety of teaching methods have been developed. However, empirical evidence is sparse (Dettmer et al., 2000; Simpson, 2005). Empirical evidence on the use of visual supports in physical education does not exist. Therefore, this will be the first study reporting the effectiveness of the use of visual supports in inclusive physical education for students with autism.

Statement of the Purpose

The purposes of this study were: (1) to examine the effects of visual supports on individuals with autism time-on-task behavior in inclusive physical education, (2) to examine the effects of visual supports on individuals with autism time-off-task behavior in inclusive physical education, and (3) to examine the effects of visual supports on individuals with autism assisted task behavior in inclusive physical education.

Definition of Terms

Time-on-task - the participant engaged in the desired activity that was consistent with the lesson objectives. Defining time-on-task was consistent with Active Learning Time-Physical Education (ALT-PE). During time-on-task, the participant independently engaged in the desired activity or task while using equipment that was developmentally appropriate (Parker, 1989).

Time-off-task - the participant not engaged in the desired activity or task and using the equipment in a manner other than intended.

Assisted task - the participant required physical assistance from the physical educator or para-professional to start or complete the desired activity or task.

CHAPTER II

LITERATURE REVIEW

This paper seeks to provide physical educators with insight on teaching students with autism in an inclusive physical education class by addressing the characteristics and strengths of students with autism.

Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) is a spectrum of disorders that include Asperger's Disorder, Childhood Autism, Childhood Disintegrative Disorder, Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS), and Rett's Disorder (DSM-IV-TR, American Psychiatric Association, 2000). ASD are developmental disabilities that share some of the same characteristics, however, no two children with ASD are the same (National Information Center for children and Youth with Disabilities (NICHCY), 2004; Rao & Gagie, 2006). Teaching children with autism are often considered confusing and complex because they are inconsistent with what is understood about human behavior and learning (Quill, 1995; Hamlin, 2005). Although advancements have been made in understanding individuals with ASD and intervention strategies have been developed, children with ASD are a perplexing group of individuals as no two individuals with ASD are the same, nor is there one best teaching method for all students with ASD (Rao & Gagie, 2006; Simpson, 2005). When determining the best teaching methods for a student with autism, it would be beneficial to understand and take into

consideration the characteristics of students with ASD and focus on the individual's strengths to create individualized instructional techniques that will aid in creating a successful teaching environment (Mesibov & Shea, 1996; Rao & Gagie, 2006; Simpson, 2005).

Characteristics of Students with Autism

Individuals with ASD have difficulty processing information, display deficits in communication, play, and social interactions, demonstrate the inability to relate to others, and display restricted and repetitive patterns of behavior (DSM-IV-TR, American Psychiatric Association, 2000; Rao & Gagie, 2006). Diagnostic criteria for autism according to Diagnostic and Statistical Manual of Mental Disorder, Fourth edition (DSM-IV-TR) by the American Psychiatric Association (2000) are:

A. A total of six (or more) items from (1), (2), and (3), with at least two from (1), and one each from (2) and (3):
    (1) qualitative impairment in social interaction, as manifested by at least two of the following:
        (a) marked impairment in the use of multiple nonverbal behaviors, such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction
        (b) failure to develop peer relationships appropriate to developmental level
        (c) a lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g., by a lack of showing, bringing, or pointing out objects of interest)

(d) lack of social or emotional reciprocity

(2) qualitative impairments in communication as manifested by at least one of the following:

(a) delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gesture or mime)

(b) in individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others

(c) stereotyped and repetitive use of language or idiosyncratic language

(d) lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level

(3) restricted, repetitive, and stereotyped patterns of behavior, interests, and activities as manifested by at least one of the following:

(a) encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus

(b) apparently inflexible adherence to specific, nonfunctional routines or rituals

(c) stereotyped and repetitive motor mannerisms (e.g., hand or finger flapping or twisting or complex whole-body movements)

(d) persistent preoccupation with parts of objects

B. Delays or abnormal functioning in at least one of the following areas, with onset prior to age 3 years: (1) social interaction, (2) language as used in social communication, or (3) symbolic or imaginative play.

C. The disturbance is not better accounted for by Rett's Disorder or Childhood Disintegrative Disorder (p. 75).

An important characteristic of students with ASD is how they process information. Hermelin and O'Connor (1970) were first to explain that children with autism processed information better visually than auditory. Since then children with ASD have been characterized as visual learners, they process information more effectively if it is seen rather than heard (Cohen, 1998; Grandin, 1995; Lincoln, Courchesne, Kilman, Elmasian, & Allen, 1988; Quill, 1995, 1997; Tissot & Evans, 2003). However, it must be noted that individuals with ASD have a wide variety of needs and abilities that require specialized individual instructional techniques (Mesibov & Shea, 1996; Tissot & Evans, 2003).

Tissot & Evans (2003) advise that individuals with ASD may have difficulty understanding verbal instructions, but may understand visual instructions in the form of two-dimensional (written words, line drawings, or pictures) or three-dimensional (gestures or expressions). Temple Grandin (1995), a successful adult with high functioning autism who is a professor at Colorado State University, describes in her book, *Thinking in Pictures* what it is like to live with autism. She states:

> I think in pictures. Words are like a second language to me. I translate both spoken and written words into full color movies, complete with sound, which run like a VCR tape in my head. When somebody speaks to me, his words are instantly translated into pictures (p.19).

Therefore, when teaching students with autism, it is important to be aware of how the student processes information efficiently. Basically, students with ASD have difficulty attending to and understanding auditory input, but process visual prompts more efficiently which supports the learning style of children with autism (Hodgdon, 1995; Quill, 1997).

Theoretical Premise for Information Processing

Children with ASD process information differently than students without ASD. Children with ASD have strengths in rote memory, cued recall, associative learning and have a stronger memory for non-verbal information compared to memory from verbal information (Pror & Chin, 1976; Quill, 1995, 1997; Sigman, Dissanayake, Arbelle, & Ruskin, 1997). However, their weaknesses are in abstract thinking, communication, and social cognition. Hermelin and O'Connor (1970) advised that students with ASD process visual information better than auditory information due to the amount of time the child had to encode and organize the information. Research supports the fact that children with ASD are visual learners through intelligence tests. These tests suggest that children with ASD perform better on tasks that included consistent visual stimuli such as matching, object assembly, pattern analysis, and discrimination (DeMyer, 1975; Lincoln et al., 1988; Siegel, Minshew, & Goldstein, 1996). Therefore, using visual supports focuses on the strengths of how students with autism process information (Quill, 1995).

Visual Supports

Visual supports include pictures, line drawings, visual activity schedules, spots and lines on the floor, timers, written schedules, and specific boundaries (Blubaugh & Kohlmann, 2006; Earles, Carlson, & Bock, 1998; Rao & Gagie, 2006).

Visual supports aid in maintaining attention, sequencing and organizing the environment, assist in understanding spoken language, and preparing students for an activity or a transition (Hodgdon, 1995; Odom et al., 2003; Quill, 1995, 1997; Rao & Gagie, 2006). Hodgdon (1995) explained that visual supports compensate for difficulties in maintaining attention, processing auditory information, and sequencing and organizing the environment, while increasing student's compliance and decreasing behavioral problems for individuals with ASD. Visual supports facilitate communication and social development, while also managing challenging behaviors (Charlop-Christy, Carpenter, Le, LeBlanc, & Kellet, 2002; Quill, 1995). Heflin and Simpson (1998) expanded on Hodgdon (1995) and Quill (1995) in that visual supports also provide students with autism with clear expectations, predictable schedule of events, promote independent transitions, and indicate changes that may occur throughout a day (Morrison, Sainato, BenChaaban, & Endo, 2002). Visual supports provide predictability, order, and consistency which are what students with ASD desire (Simpson & Myles, 1998).

Although visual supports are being used by educators, there is a deficiency in empirical evidence supporting the implementation of visual supports (Dettmer et al., 2000; Rao & Gagie, 2006). The research conducted has indicated that the use of visual supports for students with autism improves literacy skills (Broun, 2004; Kluth & Darmody-Latham, 2003), encourages positive behaviors (Crozier & Sileo, 2005), facilitates smooth activity transitions (Dettmer et al., 2000; Schmit, Alper, Raschke, & Ryndak, 2000), aids in students with ASD to initiate interactions (Johnston, Nelson, Evans, & Palazolo, 2003; Jolly, Test, & Spooner, 1993; Kranz & McClannahan, 1993; Schwartz, Garfinkle, & Bauer, 1998; Wolfbert & Schuler, 1993; Zanolli, Daggett, &

Adams, 1996), and provides predictability (Kimball, Kinney, Taylor, & Stromer, 2003; Kimball, Kinney, Taylor, & Stromer, 2004). Visual supports aid in reducing anxiety by taking an abstract concept and turning it into something concrete, which allows the student with ASD to focus on a specific task (Rao & Gagie, 2006). Visual supports also sequences specific tasks that provides students with ASD the opportunity to complete the task independently (Dettmer et al., 2000).

The teaching techniques for teaching students with autism that focus on the use of visual supports that will be discussed are the Treatment and Education of Autistic and Related-Communication-Handicapped Children (TEACCH), the Picture Exchange Communication System (PECS), and visual schedules.

Treatment and Education of Autistic and Related-Communication-Handicapped Children (TEACCH)

TEACCH was developed by Eric Schopler in 1970 and is a program that builds on individuals with ASD learning strengths rather than forcing the learner to conform to society in an effort to promote independence (Auxter, Pyfer, & Huettig, 2005; Houston-Wilson, 2005; Mesibov, 2006). The TEACCH Program emphasizes individual assessment to focus on the individual's abilities and interests, provide developmentally appropriate modifications, while taking into consideration characteristics of autism that affect the individual (Mesibov, 2006). The long term goals of the TEACCH Program are community integration and adult independence to the maximum extent possible (Mesibov &Shea, 1996). The instructional strategies of TEACCH that aid in facilitating a positive experience are structured teaching. This includes organizing the physical environment, developing daily schedules, providing clear and explicit expectations, and using visual

cues for presenting material and prompting instructional sequences (Schopler, Mesibov, & Hearsey, 1995; Mesibov & Shea, 1996). Structured teaching provides a predictable environment for students with ASD that decreases inappropriate behaviors (outbursts, not following directions, & stereotypical behaviors) (Blubaugh & Kohlmann, 2006; Savner & Myles, 2000).

Picture Exchange Communication System (PECS)

PECS was developed by Bondy & Frost (1994) within the Delaware Autistic Program (DAP) for children with deficits in social-communication to provide them with a functional self-initiated communication system. PECS is an augmentative communication system that promotes meaningful interactions between the child and the environment as it requires the child to approach a listener and initiate interactions (Bondy, 2001; Bondy & Frost, 1994, 2001). PECS includes behavior based instruction techniques such as backwards chaining, fading, physical prompts, and shaping (Charlop-Christy et al., 2002; Heflin & Simpson, 1998). PECS provides the individual with autism the use of black-and-white or color drawings in exchange for a desired item (Charlop-Christy et al., 2002). Although PECS is widely used in education, there is a lack of empirical evidence on its effectiveness with individuals with ASD (Charlop-Christy et al., 2002). However, there are positive outcomes reported such as students acquired independent use of PECS and increases in speech (Bondy & Frost, 1994, 2001; Charlop-Christy, Carpenter et al., 2002; Schwartz et al., 1998). Remembering that individuals with ASD process visual information more efficiently, PECS is a strategy that provides concrete pictures and objects while improving communication (Bondy & Frost, 1994, 2001). PECS is user friendly and can be easily implemented in classrooms. The pictures are universal and

used to label objects, create schedules, and routines (Earles et al., 1998; Heflin & Simpson, 1998).

Visual Schedules

Visual schedules provide organization and predictability, an understanding of expectations, an awareness of a change in a routine, the ability to make choices and promote independence while capitalizing on students' with ASD visual strengths (Dalrymple, 1995; Hodgdon, 1995; MacDuff, Krantz, & McClannahan, 1993; Morrison, Sainato, BenChaaban, & Endo, 2002; Schopler et al., 1995). Visual schedules also provide students with autism concrete time and steps needed to complete a specific task (Heflin & Simpson, 1998). Implementation of visual schedules should be based on the visual support needs of the student with autism. Some students may require photographs, line drawings, or written words to create a visual schedule (Earles et al., 1998). Research supports the use of visual schedules to improve transitions, increase independence, increase compliant behaviors (Boucher & Lewis, 1989; Bryan & Gast, 2000; Dettmer et al., 2000; Hermelin & O'Conner, 1970; Layton & Watson, 1995; Mirenda & Santogrossi, 1985; Wolfberg & Schuler, 1993), and maintain time-on-task behavior (Bryan & Gast, 2000; MacDuff et al. 1993) while focusing on students' with autism visual strengths.

Physical Education and Autism

It must be noted that physical education is a direct service that is included under the definition of special education, specifically, the Individuals with Disabilities Education Act of 1990 (IDEA). IDEA also indicates an Individualized Education Program (IEP) is to be developed to establish curriculum goals and objectives for students with disabilities; this also includes physical education (Winnick, 2005).

Physical educators need to take into consideration the unique challenges and abilities of students with autism in an effort to create a successful and safe environment that facilitates learning (Auxter et al., 2005; Houston-Wilson, 2005; Schultheis et al., 2000). Modifications to activities and alternate teaching strategies are needed, but it must be kept in mind that each student with autism is unique and what may work for one student may not work for another (Rao & Gagie, 2006; Simpson, 2005). Weber and Thorpe (1992) indicated that physical education has not implemented the appropriate adaptations to maximize instruction for students with autism. The atmosphere of the physical education environment can cause sensory overload for a child with autism (Houston-Wilson & Lieberman, 2003). Therefore, physical educators need to provide an organized and predictable environment for students (Houston-Wilson & Lieberman, 2003). This can be accomplished through creating the following: routines, daily physical education schedules, and concrete boundaries.

Creating a routine can begin prior to the student with autism entering the gymnasium through collaboration with the classroom or special education teacher (Simpson, de Boer-Ott, Smith-Myles, 2003; Mesibov, 2004). The classroom or special education teacher could have a schedule board in class that advises the student of the daily activities. When it is time for physical education, the student takes the picture of the physical education teacher or a symbol that represents physical education off the schedule board and hands it to the physical educator as they enter the gymnasium. The student would then proceed to check their daily physical education schedule board in the gymnasium (Houston-Wilson, 2005). Depending on the student's abilities, the physical education schedule board will indicate the activities in order portrayed through pictures,

line drawings, words or a combination of words and pictures (Quill, 1995; Schopler, Mesibov, & Hearsey, 1995). When creating pictures, it is important to be aware that a child with autism may have difficulties screening out irrelevant information, therefore the picture should clearly include one item (Houston-Wilson, 2005). Also, because individuals with autism have difficulty comprehending spoken language, understanding systems, orderly relationships, and time in conjunction with the constant changing of the physical education environment, it is important to develop a routine that will notify the student an activity is ending. This can be accomplished through the use of visual warning devices such as timers or stop watches (Dettmer et al., 2000). When the timer goes off, the student is to check their schedule for the next activity. If there is down time in physical education, an area can be marked with the students name or a picture of the student that informs the student where to wait.

Boundaries designate the exact area a task is to be performed while promoting independence for a student with autism (Schopler et al., 1995; Schultheis et al., 2000; Houston-Wilson & Lieberman, 2003). Boundaries can be in the form of cones, floor tape or higher boundaries that block students view to minimize distractions (Houston-Wilson & Lieberman, 2003; Schultheis et al., 2000). Benefits of boundaries have also been observed by The Treatment and Education of Autistic and Related Communications-Handicapped Children (TEACCH) recreational structure program that developed a program know as Success in Physical Activity (SPA). Observations indicated children with autism identified and remembered activities that had been clearly marked and a decrease in stereotypical behaviors occurred. Also, the boundaries used were 4 feet high which decreased the amount of external stimuli (Schultheis et al., 2000).

Appropriate modifications and adaptations will facilitate a successful environment for a student with autism, their peers, and the educator (Houston-Wilson & Lieberman, 2003). Quality and accessible physical education programs can provide opportunities to develop and improve social skills, physical fitness skills, interaction with peers, cooperative learning, and personal and social responsibilities while also exposing students with and without disabilities to lifelong activities (Auxter et al., 2005; National Center for Chronic Disease Prevention and Health Promotion, 2004; Sherrill, 2004; Staveren & Dale, 2004).

The physical education environment has not efficiently been modified to provide maximum instruction time for students with autism (Weber & Thorpe, 1992). However, with increased awareness of the characteristics of students with autism and collaboration among special education teachers and physical educators, the appropriate modifications can be implemented for the students with autism (Simpson et al., 2003).

Academic Learning Time-Physical Education (ALT-PE)

There are many factors that are attributed to student achievement such as class size, teacher instruction, teaching methods, and the amount of time a student spends engaged in a specific concept or skill. For the purposes of this study, the amount of time a student is engaged in a specific task in physical education will be analyzed. Academic learning time-physical education measures the amount of time a student is engaged in a desired activity that is consistent with the lesson objectives (Parker, 1989).

Research has indicated there is a correlation between student achievement and the amount of time a student is engaged in a task (Metzler, 1989; Siedentop, 1983). Research has specifically indicated a correlation between ALT-PE and with students with

disabilities achievements in physical education (Temple & Walkley, 1999; Vogler, van der Mars, Cusimano, & Darst, 1992). Basically, more experiences or opportunities to practice a specific skill increase the opportunities for learning to occur.

Currently research conducted on students with autism ALT-PE is limited and consists of studies that indicate students with ASD can increase their on-task behavior with the use of peer tutors and behavior management techniques such as a token economy (Igo, French, & Kinnison, 1997; Mangus, Henderson, & French, 1986). The only research conducted on student with autism and their ALT-PE was by Lisboa (1995) which observed three students with autism for 5 consecutive physical education class periods in three settings (1) regular physical education; (2) reversed mainstreamed; and (3) adapted physical education. The results indicated the student with autism that was placed in regular physical education achieved an ALT-PE of 33.6%, the student with autism in the reversed mainstreamed physical education class had an ALT-PE of 42.6%, and the student with autism that was placed in the adapted physical education class had the highest ALT-PE of 48.4%. All of the students with autism demonstrated higher than acceptable ALT-PE according to Rink (1993) of 15 to 25%. This was attributed to an individualized curriculum taught by experienced teachers and teacher assistants.

Summary

Autism Spectrum Disorder is the fastest growing developmental disorder in the United States (CDC, 2007). This makes it extremely likely for teachers to teach a few students with ASD during their career. However, teachers have expressed concerns regarding teaching students with disabilities, specifically students with ASD. Teachers feel they have not received adequate training or the resources needed to meet the needs of

students with disabilities in an inclusive setting (Block, 2003; LaMaster, Gall, Kinchin, & Siedentop, 1998; Lienert, Sherrill, & Myers, 2001). In regards to students with ASD, it is beneficial to have an understanding of ASD and the characteristics of children with ASD (Mesibov & Shea, 1996). Students with ASD have difficulty comprehending spoken language, understanding systems, orderly relationships, and time. In addition, students with ASD demonstrate deficits in socialization, cognitive functioning, sensory stimulation, behavior, and communication. Therefore, educators need to focus on the strengths of students with ASD to create individualized instructional techniques that will aid in creating a successful teaching environment (Mesibov & Shea, 1996; Rao & Gagia, 2006; Simpson, 2005). Another objective for teachers working with students with disabilities is fostering independence (Hall, McClannahan, & Krantz, 1995; Mechling & Gast, 1997). Individuals with ASD also do not automatically discriminate cues in their environment that facilitate independence which causes them to be dependent on prompting from teachers or paraprofessionals (Hodgdon, 1995). Also, individuals with ASD are characterized as visual learners; essentially they process visual information more effectively than auditory information (Cohen, 1998; Grandin, 1995; Lincoln et al., 1988; Quill, 1995; Tissot & Evans, 2003). Therefore, focusing on students with ASD visual processing by the use of visual supports is recommended. Visual supports aid in maintaining attention, providing predictability through sequencing and organizing the environment, understanding spoken language, and preparing students for an activity or a transition (Bryan & Gast, 2000; Hodgdon, 1995; Odom et al., 2003; Quill, 1995, 1997; Rao & Gagie, 2006; Simpson & Myles, 1998).

In regards to students with ASD in physical education, it has been stated that physical education has not implemented the appropriate adaptations to maximize instruction for students with autism (Weber & Thorpe, 1992). The atmosphere of the physical education environment can cause sensory overload for a child with autism (Houston-Wilson & Lieberman, 2003). Therefore, physical educators need to provide an organized and predictable environment for students (Houston-Wilson & Lieberman, 2003). Simpson et al. (2003) stated, “Independent of the exact nature and severity of their disability, all children and youth with autism spectrum disorder require careful individualized planning to experience educational success” (p.116).

Based on the review of literature and the lack of empirical evidence, the following study was designed to investigate the effects of the use of visual supports on time-on-task, time-off-task, and assisted task behaviors of students with autism in an inclusive physical education class.

The purposes of this study were to examine the effects of visual supports on time-on-task, time-off-task, and assisted task behaviors for students with autism in inclusive physical education.

CHAPTER III

METHODS

Purpose

The purposes of this study were: (1) to examine the effects of visual supports on time-on-task behavior for students with autism in inclusive physical education, (2) to examine the effects of visual supports on time-off-task behavior for students with autism in inclusive physical education, and (3) to examine the effects of visual supports on assisted task behavior for students with autism in inclusive physical education.

Participants

The setting for this study was a rural elementary school (K-5) located in the Southeastern United States (pseudonym Thomasonville Elementary). The school enrolls approximately 927. This was an inclusive school with 23 students with disabilities 4 of which are autistic. The researcher had previous experiences in this setting and during the research taught three reverse mainstreamed physical education classes five days a week that were comprised of one to two students with ASD and 12 to 15 peers without disabilities. The researcher had developed a rapport with the school for two years through previous teaching experiences in adapted physical education and consulting. The researcher not only taught with and consulted the physical educators but also observed the students with autism in their inclusive physical education setting which included 60 to 80 peers without disabilities. The researcher spent three days a week in physical

education also fulfilling her graduate assistantship requirement with the University. The physical education curriculum focused on free play and practice for fitness testing basically aerobic and flexibility activities. Thomasonville Elementary had daily physical education for 30 minutes with class sizes ranging from 60 – 80 students including students with disabilities.

The participants were selected because they met the autism spectrum disorders criteria according to Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR, APA, 2000) and The Childhood Autism Rating Scale (CARS) (Schopler, Reichler, & Rochen-Renner, 1988). Upon IRB approval and consent forms were returned, the participants were 4 students (3 males and 1 female) with autism (see Table 3.1).

Pseudonym	Sex	Age	Grade
Zack	Male	5-year, 10-month old	Kindergarten
Hogan	Male	5-year, 7-month old	Kindergarten
Chad	Male	8-year, 7-month old	Second
Tristen	Female	9-year, 9-month old	Fourth

Table 3.1. Participants information.

Setting

The physical education sessions were taught by the researcher who was certified as a K-12 physical educator and an adapted physical educator, with five years teaching experience. Physical education was held daily for 20 – 30 minutes. For the purposes of the study, students with ASD were placed in a reversed mainstream physical education environment. Depending on the facility available (inside or outside) to conduct the physical education session, the class sizes ranged from 12 – 15 students that were

randomly selected by the physical education teacher daily in addition to the student with ASD. The class consisted of a warm up (instant activity), fitness component (exercise), and skill development.

Prior Observations of Participants

Prior to the study, the researcher continually maintained observational field notes of the participants' behaviors, interactions with peers, and participation in their inclusive physical education class. The inclusive physical education class size ranged from 60 – 80 students with two physical educators with 23 and 37 years of teaching experience and two physical education aids with seven years experience. All four participants attended inclusive physical education however, three of the four participants attended physical education with a para-professional. The three participants with a para-professional did not initiate peer interactions or respond to peer interactions and consistently required verbal or physical assistance (see Table 3.2 for detailed field notes of description of participants).

Table 3.2

Detailed Field Notes Description of Participants

Pseudonym	Observation Field Notes
Zack	- Required hand over hand physical assistance to perform given tasks. - Stereotypical behaviors (i.e., hand/arm flapping, spinning) would occur if his hand was not held by his para-professional. - Did not initiate interactions or respond to peer interactions. - No spontaneous speech – used gesture (i.e., pointing or pulling someone to a desired object). - Currently learning how to use PECS. - On the playground would run around or sit down and

	play with the stones on the ground. Would not attempt to use playground equipment.
Hogan	- Initiated peer interactions. - Responded to peer initiations. - When specifically addressed one-to-one he followed directions and remained on task. - Displays high levels of vocabulary. - Problem behaviors – grabbing objects from peers, pushing, and having tantrums. These occurred when he did have his desired object due to color or he was presented with a non-preferred task.
Chad	- Initiated interactions with peers, however some interactions were inappropriate such as hanging on, touching a peer, or being in a peers personal space. - If approached by a peer would follow them for 1 – 2 minutes. - Receptive to hand-over-hand assistance. - Echolalia and non-contextual speech. - Inappropriate laughter. - At times maintained eye contact. - Stereotypical behaviors (i.e., hand/arm flapping, bouncing). - Problem behaviors – outbursts which occurred when presented with a non preferred task.
Tristen	- Did not initiate interactions with peers or respond to peer interactions, possibly becoming aggressive with peers. - Socially withdrawn. - Responds to and works well with adults. - Required consistent assistance from para-professional. - Did not participate or stay in the gymnasium the entire physical education class due to safety concerns to herself or other. - Stereotypical behaviors (i.e., rocking, swinging arms, biting self).

The researcher also maintained field notes of the physical educators' comments and concerns regarding teaching students with autism in inclusive physical education. The physical educators' and physical education assistants' comments focused on how the behaviors of students with autism were distracting to the class, and how communication

with the student with autism was difficult. When the physical educators and aids were asked about their concerns teaching students with autism, their comments were, “These students need a one to one.”, “The noises and yelling out and getting up and walking around from the student with autism are distracting to the teacher and the class.”, “Some of the students with autism we have taught have been aggressive and hit other students however, those students are no longer in the elementary school.”, “Some days the students with autism response and some times they do not.”, “I have noticed the students with autism like activities involving running and bowling.” When the physical education staff was asked what was the most difficult aspect of teaching students with autism, they all responded, “the biggest thing is trying to communicate with them.”

Dependent Variables

The dependent variables were the participant’s percentage of time-on-task, time-of-task, and assisted task behaviors in inclusive physical education.

Independent Variable

The independent variable was the use of visual supports during physical education sessions. Visual supports include pictures, line drawings, visual activity schedules, spots and lines on the floor, timers, written schedules, and specific boundaries. It must be noted, the only variable that changed during the intervention was the implementation and use of visual supports.

Materials

Visual supports used include pictures, task cards, line drawings, visual activity schedules, spots and lines on the floor, timers, and specific boundaries (Blubaugh & Kohlmann, 2006; Earles et al., 1998; Rao & Gagie, 2006). The activity schedule was

comprised of line drawing or words that depicted the activities for the session in sequential order with the participants name at the top. The activity schedule was created by a white board and velcro (See Figure 3.1).

Figure 3.1. Activity schedule.

The line drawings were taken from a computer program (BoardmakerPlus) used by the special education department which were laminated. The physical educator and the para-professionals each had a PECS ring attached to a lanyard with line drawings of physical education activities and commands such as sit, stand, check schedule, throw, and catch (See Figure 3.2).

Figure 3.2. PECS ring.

Task cards (See Figure 3.3 – 3.5) were created depicting a specific exercise or task (i.e. tennis, bowling, jumping jack).

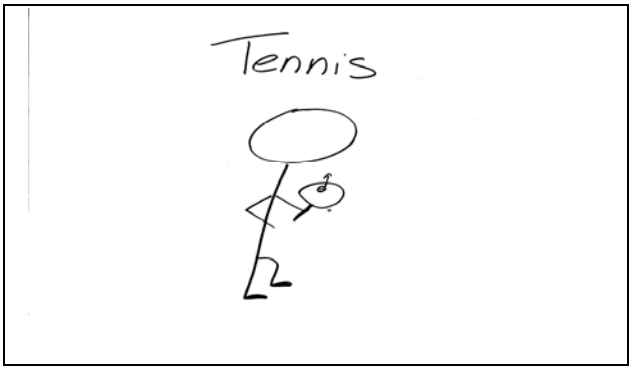


Figure 3.3. Tennis task card.

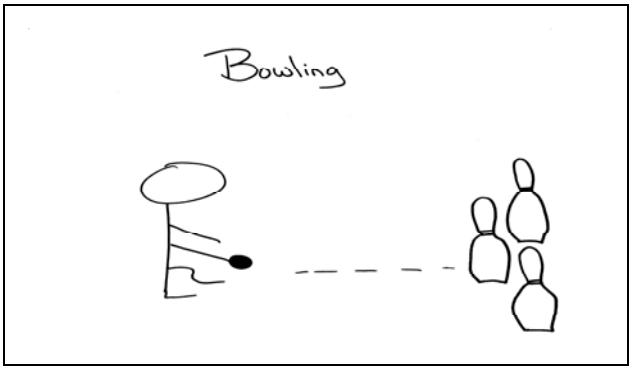


Figure 3.4. Bowling task card.

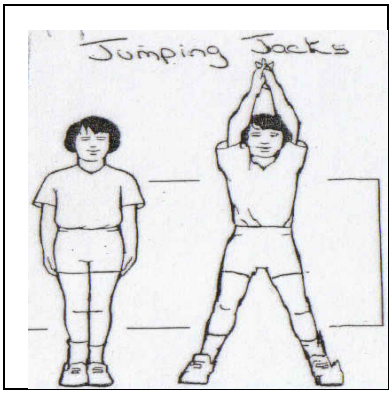


Figure 3.5. Jumping jacks task card.

Data Collection

Data were collected over an 8-month period, 38 baseline sessions, 44 intervention sessions, and 9 maintenance sessions were observed (total of 91 sessions were observed). When maintenance data were collected, it was 1 week, 2 weeks, and 12 weeks after the intervention. All baseline, intervention, and maintenance physical education sessions were videotaped and coded to determine the extent the students were on-task, off-task, or assisted task during each session. A camera was set up on a tripod to capture the entire physical education class and a physical education aid assisted to ensure the participants were continuously in the video. The researcher whom was the physical education teacher wore a wireless microphone to capture the specific tasks presented to the class. ALT-PE data were collected manually following the configuration of the Behavior Evaluation Strategy and Taxonomy (BEST: Sharpe & Koperwas, 1999) that measures real-time observation data by recording the frequency in which the participants were either engaged or not engaged in the desired task. For the purposes of this study, all the videotaped sessions were analyzed using 6-second whole-intervals in determining if the participants were on-task, off-task, or assisted task.

Observer Reliability

The researcher was the physical educator and the primary observer that reviewed all the videotaped sessions and analyzed the participant's time on task, time of task, and assisted task behaviors. The participants in kindergarten were in the same physical education class however the researcher analyzed one participant at a time. Once one participant was analyzed, the videotape was rewound and the second participant's time on task was analyzed. Intraobserver reliability checks were conducted by the researcher

randomly selecting sessions to reanalyze after 3 weeks of the original analysis of sessions (van der Mars, 1989b). Intraobserver reliability was 100%. To determine interobserver agreement (IOA), a second researcher who had experience using the BEST program was used as a second observer. The second observer was trained to manually code each session in six second whole-intervals using the coding sheet and a stop watch. The researcher and the observer randomly selected and independently coded 20% of the sessions as recommended by Cooper and colleagues (1987). Therefore, IOA reliability checks were conducted for a total of nineteen sessions (eight during baseline phase, eight during intervention phase, and three during maintenance phase). Overall agreement was calculated by the number of agreements divided by the number of agreements plus disagreements multiplied by 100 (van der Mars, 1989b). The mean IOA for baseline was 90.25% with a range of 87 – 93%. The mean IOA for intervention was 91.75% with a range of 89 - 95%.

Experimental Design

The effectiveness of visual supports on time-on-task, time-off-task, and assisted task behaviors of students with autism in inclusive physical education were examined. A single subject delayed multiple baseline design across 4 participants with autism (3 boys and 1 girl) ages 5-9 was used (Cooper, Heron, & Heward, 1987). The study included 7 – 12 sessions of baseline, 11 sessions of intervention, and 1 - 3 sessions of maintenance for each participant. This method was chosen because delayed multiple baseline research does not remove the intervention and revert back to baseline, which would be unethical for the students with autism.

Four participants with autism were studied (two of the four were in the same kindergarten physical education class). All physical education sessions during baseline and intervention phases were videotaped and analyzed to determine the participants' percentage of time-on-task, time-off-task, and assisted task behaviors. Physical education sessions during baseline and intervention phases were taught by the same physical educator and it must be noted that the only variable that changed between baseline and intervention during the physical education sessions was the use of visual supports. Visual supports used included pictures, line drawings, visual activity schedules, spots and lines on the floor, timers, written schedules, and specific boundaries.

Data Analysis

In determining the effects of the use of visual supports on the participants' time-on-task, time-off-task, and assisted task behavior in inclusive physical education, each videotaped session was coded in 6 second whole-intervals (van der Mars, 1989a) during baseline and intervention phases. Whole-interval recording of 6-second duration was used to minimize the possibility of several behaviors being observed in the same interval (van der Mars, 1989a).

Following the BEST format, the researcher used a coding sheet (see Appendix C) and a stop watch that beeped every six seconds. Time-on-task was coded if the participant was independently performing the desired task for the entire 6 seconds, time-off-task was coded if the participant was not participating in the desired task, or assisted task was coded if the participant required assistance from the para-professional or physical educator to start or complete an activity within the 6 second interval. At the end

of each session, frequency counts for each variable were totaled and input into an excel spreadsheet that calculated the percentage for each variable for each participant.

The analysis consisted of recording the variability and trends, and changes in the level, means, trend, and percentage overlap between baseline and intervention phases. Calculating the percentage overlap was done by counting the number of data points in the intervention phase that overlapped with baseline data points and dividing that number by the total number of data points during the intervention (Lieberman, Dunn, van der Mars, & McCubbin, 2000). According to Lieberman, et al. (2000) if there is a low percentage of overlap but an increase between the baseline and the intervention, then it is more than likely that the increase was due to the intervention.

CHAPTER IV

RESULTS

The purpose of this study was to indicate the effects of the use of visual supports on (1) time-on-task, (2) time-off-task, and (3) assisted task behaviors for students with autism during inclusive physical education. The individual results for each participant are graphically presented in Figures 5 through 8 showing the participants time-on-task, time-off-task, and assisted task behaviors during baseline and intervention phases.

Overall Results

As demonstrated in Table 4.1, the time-on-task for all four participants increased, while the time-off-task and the assisted task behaviors decreased between baseline and intervention phases, indicating positive effects from the use of visual supports.

Table 4.1

Total Mean Percent of Time-On-Task for Baseline, Intervention, and Mean Percentage of Increase or Decrease Between Conditions for all Participants

Variable	Baseline mean (%)	Intervention (%)	Total (%) Increase or Decrease
Time-On-Task	36.70	63.40	↑ 26.70
Time-Off-Task	29.88	15.23	↓ 14.65
Assisted Task	33.43	21.39	↓ 12.04

The total mean percentage for all four participants time-on-task during baseline was 36.70% and 63.40% during intervention with an overall increase of 26.70%. The total

mean percentage for all four participants time-off-task behaviors during baseline was 29.88% and 15.23% during intervention with an overall decrease of 14.65%. The total mean percentage for all four participants assisted task behaviors during baseline was 33.43% and 21.39% during intervention with an overall decrease of 12.04% (see Table 4.1). Figure 4.1 indicates an increase in each participant's time-on-task behaviors between baseline and intervention phases.

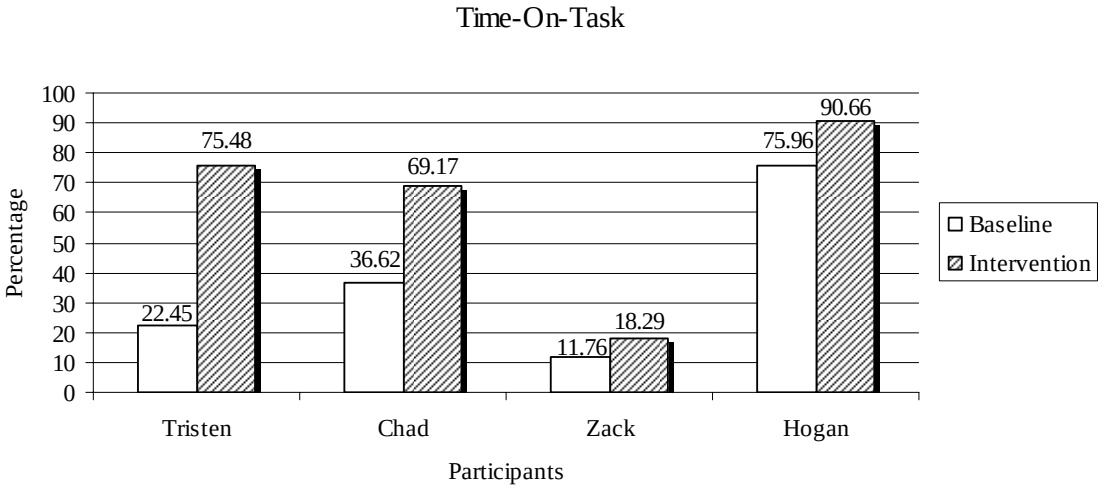


Figure 4.1. Percentages of Time-On-Task Behavior During Baseline and Intervention Phases for Each Participant.

Figure 4.2 demonstrates a decrease in each participant's off-task behaviors between baseline and intervention phases.

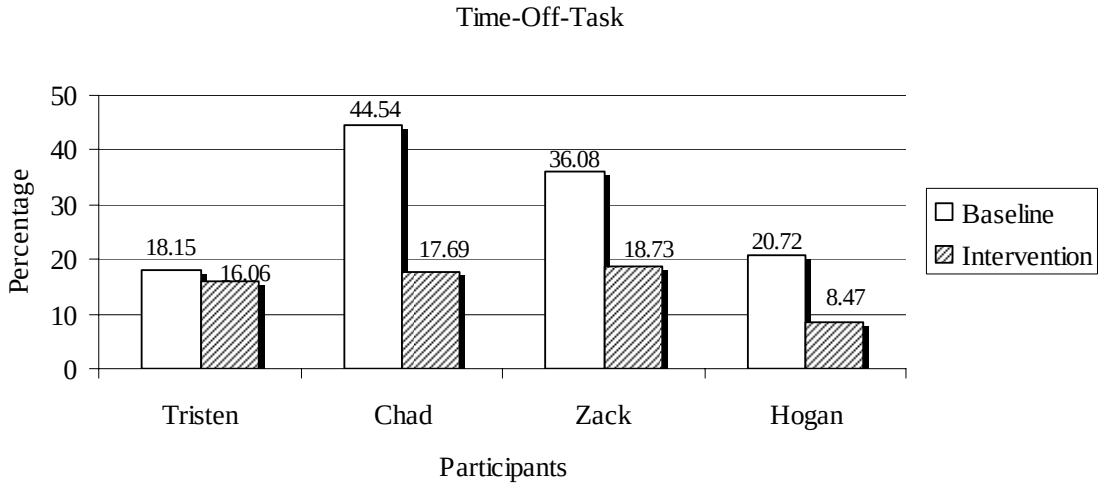


Figure 4.2. Percentages of Time-Off-Task Behavior During Baseline and Intervention Phases for Each Participant.

Figure 4.3 demonstrates each participants assisted task behaviors average percentage during baseline and intervention.

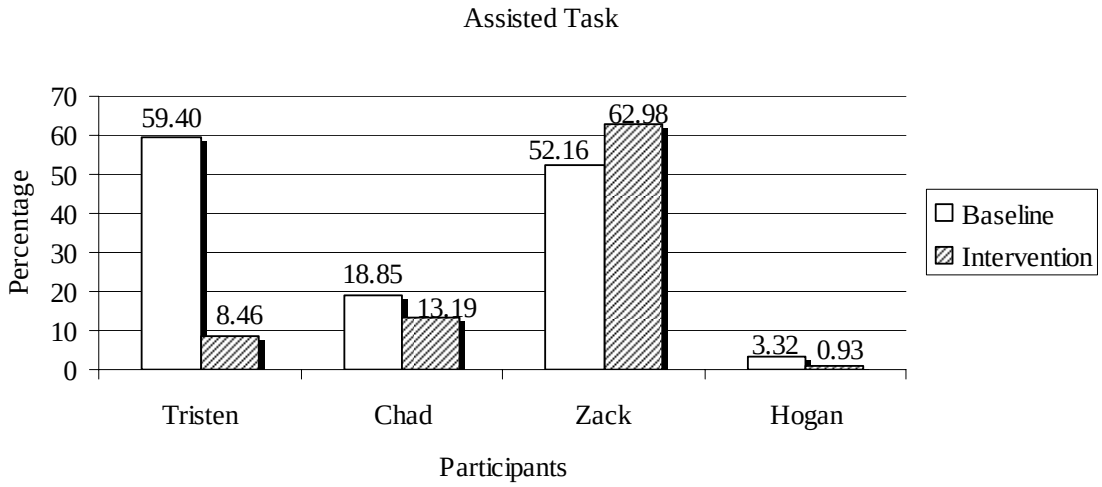


Figure 4.3. Percentages of Assisted Task Behavior During Baseline and Intervention Phases for Each Participant.

An increase did not occur until the implementation of the intervention, a functional relationship is demonstrated between the intervention and the participants' time-on-task behavior. As indicated in Figures 4.4 through 4.7, there is an upward trend

in all of the participants' time-on-task behavior during the intervention phase. Also as time-on-task increased, time-off-task and assisted task behaviors decreased, indicating an increase in the students with ASD independence as they required less assistance by the para-professional or the physical educator.

Tristen and Chad had the most increase in time-on-task behavior which could be attributed to their age and previous classroom experiences with visual supports. In the classroom, Tristen had been using visual supports for four years, and Chad had been using visual supports for two years. Zack and Hogan were in the kindergarten and just beginning to be exposed to visual supports. It must be noted that Hogan had been exposed to the use of visual supports in pre-school, where Zack's initial exposure to visual supports was in kindergarten.

Tristen

Tristen had the highest increase in time-on-task behavior as the mean time-on-task during baseline was 22.45% and after the implementation of the use of visual supports, Tristen's time-on-task progressed to 75.48% indicating a 53.03% increase (see Figure 4.4). The large increase in the mean percentage from baseline to intervention, increase change in level by 56.41%, variability, no data overlap, and upward trend during the intervention indicates positive effects from the use of visual supports. Tristen's mean time-off-task behavior during baseline was 18.15% and decreased after the implementation of visual supports to 16.06%, with a 2.09% difference. Tristen's time-off-task decreased as indicated by the decrease in mean percentage from baseline to intervention, increase change in level by 4.79%, variability, very low overlapping data (.18%), and a decreasing trend are represented in Figure 4.4. Tristen's assisted task

behavior during baseline was 59.40% and dropped drastically to 8.46% after the implementation of visual supports, indicating a 50.94% decrease in the amount of assistance required to start or complete a task. Tristen's assisted task behavior decreased dramatically as indicated by the decrease in the mean percentage from baseline to intervention, change in level decreased 61.20%, variability, low data overlap (.09%), and decreasing trend during the intervention suggest positive effects from the use of visual supports in increasing Tristen's ALT-PE.

During maintenance Tristen's time-on-task stayed above 80% as illustrated in Figure 4.4 with a mean of 83.67% time-on-task, time-off-task mean of 9.95%, and a mean of 6.38% for assisted task behaviors.

The increase in time-on-task, decrease in time-off-task and assisted task behaviors, level changes, low overlap, and upward trend in time-on-task along with a decreasing trend in time-off-task and assisted task behaviors, suggests positive effects from the use of visual supports on Tristen's ALT-PE.

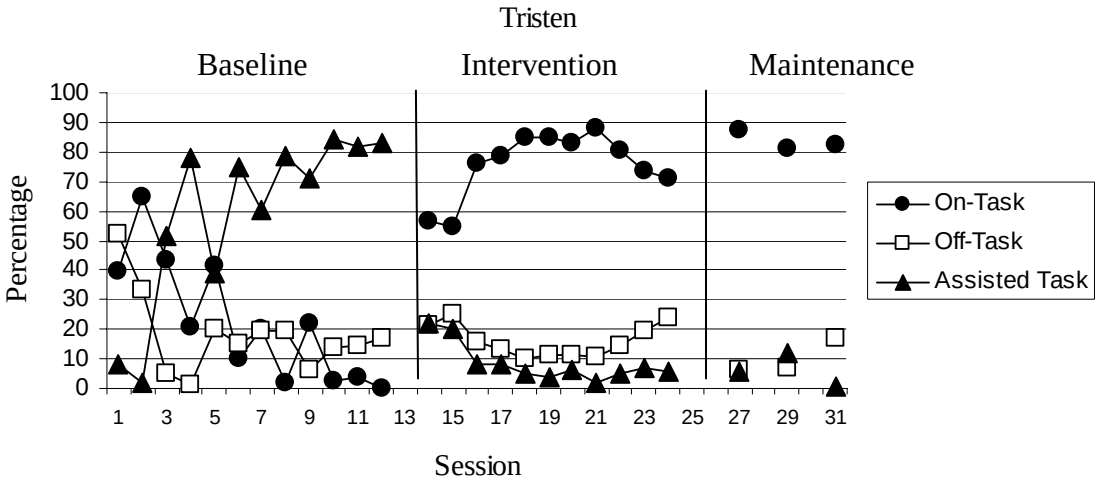


Figure 4.4. Rates of time-on-task, time-off-task, and assisted task for Tristen.

Chad

Chad's mean time-on-task was 36.62% during baseline and 69.17% after the implementation of visual supports, with an increase of 32.56% (see Figure 4.5). Chad's time-on-task increased as indicated by the increase in the mean percentage from baseline to intervention, change in level increased by 24.92%, variability, no data overlap, and an increase in trend suggest positive effects from the use of visual supports on Chad's time-on-task behaviors. Chad's mean time-off-task behavior during baseline was 44.54% and decreased after the implementation of visual supports to 17.69%, with a 26.85% difference. Chad's time-off-task behavior decreased as indicated by the decrease in the mean percentage from baseline to intervention, change in level increased by 2.73, variability, no data overlap, and a decrease in trend are indicated in Figure 4.5. Chad's assisted task behavior during baseline was 18.85% and decreased to 13.19% after the implementation of visual supports, indicating a 5.66% decrease in the amount of assistance required to start or complete a task. Chad's assisted task behavior decreased as indicated by the decrease in the mean percentage from baseline to intervention, change in level decreased by 27.65%, variability, no data overlap, and a decreasing trend suggest positive effects from the use of visual supports on Chad's ALT-PE.

During maintenance Chad's time-on-task stayed above 75% as illustrated in Figure 4.5 with a mean of 79.84% time-on-task, time-off-task mean of 11.98%, and a mean of 8.18% for assisted task behaviors. The decrease in Chad's time-off-task and assisted task behaviors indicates an increase in independent behavior while supporting

the use of visual supports.

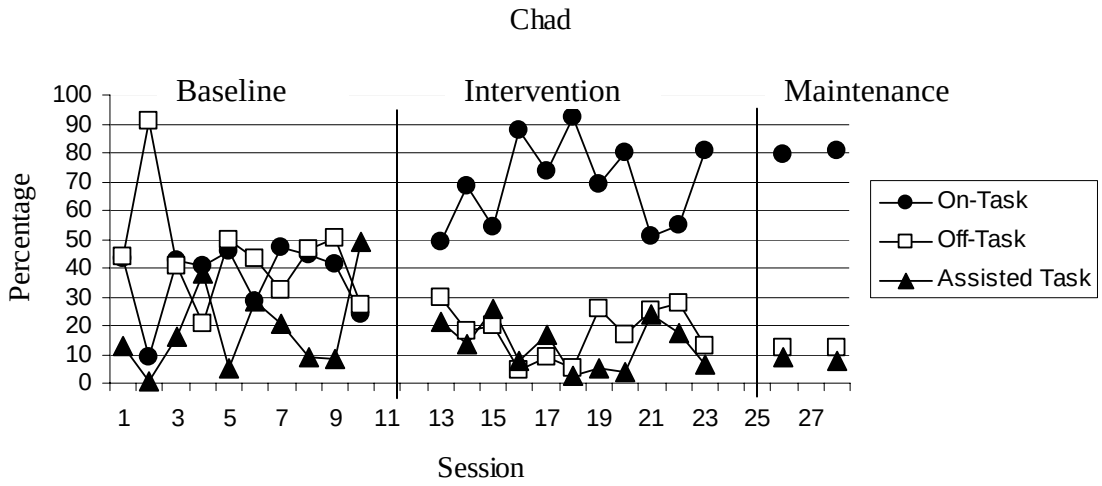


Figure 4.5. Rates of time-on-task, time-off-task, and assisted task for Chad.

Hogan

Hogan, at a first glance, appeared not to have a significant difference in time-on-task behavior however, the mean increased from 75.96% to 90.66% with a difference of 14.70% and consistent increase in time-on-task behavior during the intervention and maintenance phases. Figure 4.6 demonstrates Hogan's increase in the mean percentage from baseline to intervention, change in level increased by .85%, variability, low data overlap (.09%), and an upward and downward trend in time-on-task behavior. However, Hogan's time-on-task behavior was at 80% or higher. Hogan's off-task behavior baseline mean was 20.72% and decreased after the implementation of visual supports to 8.47%, with a decrease in off-task behavior of 12.25%. Figure 4.6 demonstrates a decreasing trend in Hogan's time-off task behavior, change in level increased by 1.45%, variability, and no overlap. Hogan's assisted task behavior during baseline was 3.32% and dropped to .93% after the implementation of visual supports, indicating a 2.39% decrease in the

amount of assistance required to start or complete a task suggesting an increase in independence. Hogan demonstrated a decrease of 2.3% in level change, no data overlap, with a decreasing trend in assisted task behavior. During maintenance Hogan's time-on-task continued in an upward trend as illustrated in Figure 4.6 with a mean of 92.52%, mean time-off-task was 7.48%, and assisted task mean was 0%. The data supports the implementation of visual supports for Hogan as demonstrated in the increase in the mean percentage from baseline to intervention in time-on-task, decrease in time-off-task and assisted task behaviors, variability, change in level, and little overlap.

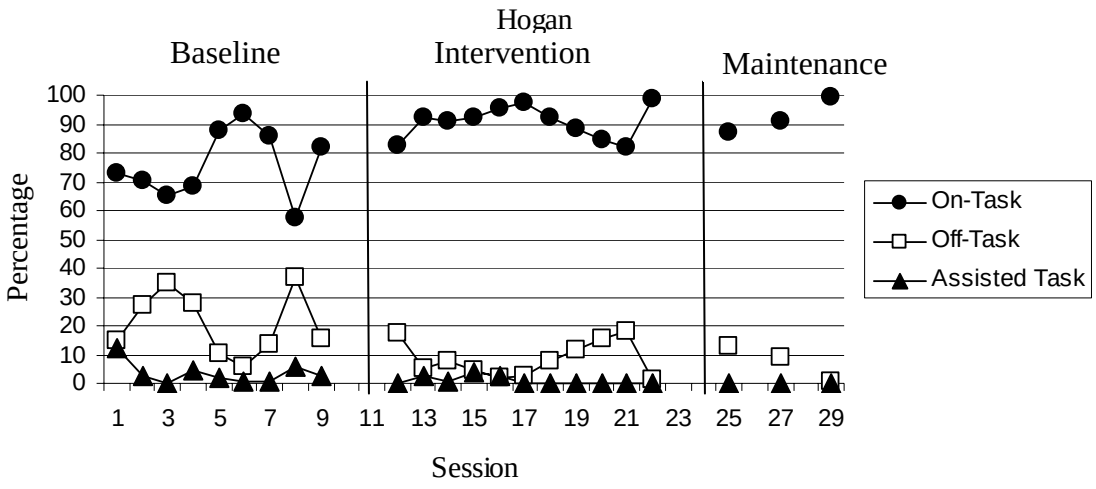


Figure 4.6. Rates of time-on-task, time-off-task, and assisted task for Hogan.

Zack

Zack had the least percentage gain, however; it must be noted that during baseline his time-on-task was 0%, indicating he was not participating in physical education. Zack exhibited an upward trend between baseline and intervention with a mean of 11.76% during baseline, and after the implementation of visual supports, the mean was 18.29%, indicating an increase of 6.52% in time-on-task behavior. Figure 4.7 demonstrates Zack's

time-on-task increase in mean percentage from baseline to intervention, changes in level increased 13%, variability, no data overlap, and an increasing trend in time-on-task behavior. Zack's time-off-task behavior during baseline was 36.08%, and after the implantation of visual supports, the mean was 18.73% indicating a decrease of 17.35% in time-off-task behavior. A decreasing trend occurred in Zacks' time-off-task behavior, variability, change in level decreased 56.61%, along with no overlap indicating the decrease in time-off-task behavior was attributed to the intervention. Zack's assisted task behavior was 52.16% during baseline and increased to 62.98% after the implementation of visual supports with an increase of 10.82%. Zack demonstrated a slightly increasing trend in assisted task behavior, variability, and level changes increased 43.61%. Only one maintenance data point was collected two weeks after the intervention for Zack due to absences. During maintenance Zack's time-on-task was 23.37% which was double the mean average during baseline. Although Zack had the least percentage gain after the implementation of the use of visual supports, and his assisted task behavior increased, it must be noted that the maintenance data point indicates an increase in on-task behavior. Zack was in the initial stages of learning; therefore the increase in his assisted task behavior provided Zack with opportunities to be physically guided through specific skills and movements.

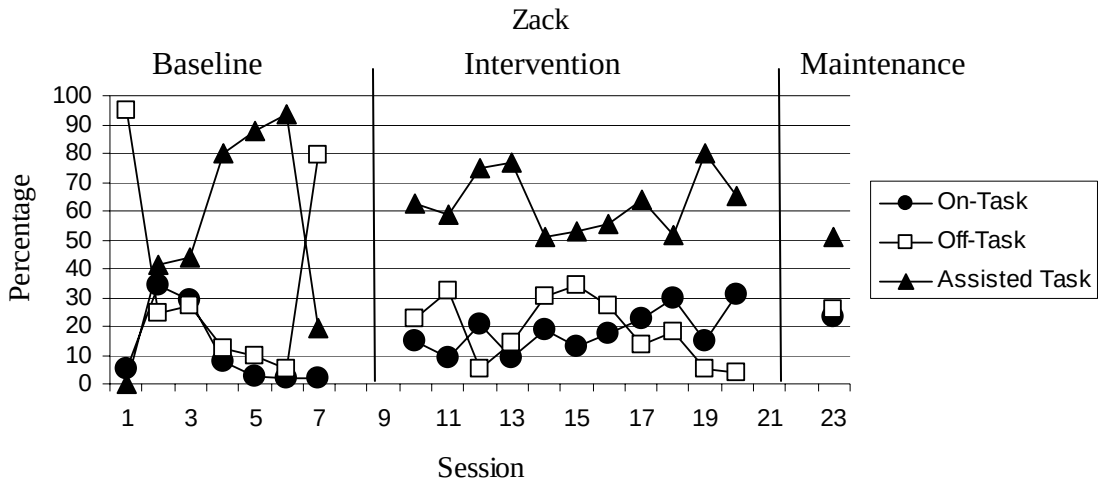


Figure 4.7. Rates of Time-On-Task, Time-Off-Task, and Assisted task for Zack.

The results of this study illustrate positive effects from the implementation of the use of visual supports. The participants with ASD increased their time-on-task with a mean increase of 26.70%, while decreasing off-task behaviors by a mean of 14.65%, and decreased assisted task behaviors with a mean of 12.04% as indicated in Table 4.1. All the participants demonstrated an increase in the mean percentage from baseline to intervention, change in level, variability, and low data overlap (see Figures 4.4 through 4.7) which suggests the use of visual supports has positive effects on increasing students with ASD time-on-task behaviors while decreasing time-off-task and assisted task behaviors. Also, during maintenance sessions, the participants' time-on-task behaviors continued to increase while time-off-task and assisted task behaviors decreased.

CHAPTER V

DISCUSSION

The purpose of this study was to indicate the effects of the use of visual supports on (1) time-on-task, (2) time-off-task, and (3) assisted task behaviors of students with autism during inclusive physical education. The findings of this study provide positive implications for the use of visual supports for students with ASD in inclusive physical education. The results provide support of a functional relationship between the use of visual supports and participants' time-on-task behaviors during inclusive physical education as demonstrated in the increase of time-on-task behavior after the implementation of the intervention. Currently there is a lack of empirical evidence supporting the use of visual supports (Dettmer et at., 2000) and specifically in physical education empirical evidence does not exist. Therefore, this will be the first study reporting the effectiveness of the use of visual supports in inclusive physical education for students with autism.

The results of this study indicate the participants' time-on-task increased by a mean of 26.70%, time-off-task decreased by a mean 14.65%, and assisted task decreased by a mean of 12.04% indicating positive effects of the use of visual supports. The increase in time-on-task with a decrease in off-task and assisted task behaviors also indicates an increase in independence in completing a task (see Figures 4.4 through 4.7). This research supports findings from MacDuff, Krantz, and McClannahan (1993) and Massey and Wheeler (2000) in that children with ASD can acquire the skills necessary to

independently use an activity schedule in a classroom. One might ask why increasing independence is important. Increasing independence is important because students with ASD are characterized as being dependent on adults for staying on task as they do not instinctively discriminate the cues in their environment that are important to function independently (Bryan & Gast, 2000; Hodgdon, 1995). Therefore, it is important for educators to focus on fostering independence for students with disabilities (Hall et al., 1995; Mechling & Gast, 1997), specifically students with autism (Bryan & Gast, 2000). Visual supports promote independence for students with ASD. They provide a specific order in which a task is to be completed, while also creating organization and predictability to their environment (Dalrymple, 1995; Hodgdon, 1995). The increase in the participants' time-on-task also influences the amount of time a skill is practiced. Basically the more time that is spent practicing a skill, the more opportunities there are to develop a skill. Schultheis, Boswell, and Decker (2000) also advise if disruptive behaviors are reduced, students are able to spend more time on a specific task, which results in a successful physical education program.

This study supports the use of visual supports for students with autism in an educational setting (Dettmer et al., 2000; Heflin & Simpson, 1998; Hodgdon, 1995; Krantz McClannahan, 1993) by emphasizing the use of visual supports to compensate for difficulties in attention, process auditory information, sequence and organize the environment, facilitate communication and social development, while aiding in decreasing challenging behaviors for individuals with ASD (Hodgdon, 1995; Quill, 1995) as indicated in the increase in the participants time-on-task behaviors. The increase on the participants time-on-task behavior is attributed to the use of visual supports as this was

the only variable that changed throughout the study. There was also an increase in the mean percentage from baseline to intervention, change in level, variability, and minimal data overlap which supports the use of visual supports in increasing students with ASD time-on-task behaviors. It must also be noted that the participants' time-on-task behaviors continued to increase during maintenance sessions indicating positive effects from the continued use of visual supports.

Visual supports provide students with ASD clear expectations, predictable schedule of events, promote independent transitions, and indicate changes that may occur throughout a day (Bryan & Gast, 2000; Heflin & Simpson, 1998; Hodgdon, 1995; Morrison, Sainato, BenChaaban, & Endo, 2002; Quill, 1995). Visual supports also provide predictability, order, and consistency which are what students with ASD desire (Dettmer et al., 2000; Simpson & Myles, 1998). Considering that research has indicated students with autism are visual learners and that visual supports positively affect students with autism in the classroom setting, it would seem logical to incorporate visual supports in all areas of education particularly physical education (DeMyer, 1975; Lincoln et al., 1988; Siegel et al., 1996; Quill, 1997).

According to the Individuals with Disabilities Education Act (IDEA), physical education is a direct service and therefore an important aspect of special education (Schultheis et al., 2000). IDEA also indicates an Individualized Education Program (IEP) is to be developed to establish curriculum goals and objectives for students with disabilities, which also includes physical education (Winnick, 2005). Therefore, it is important that the physical educator collaborates with the special education teacher in developing the IEP goals and objectives which assists in implementing the appropriate

modifications for students with ASD (Simpson et al., 2003). In aiding in determining goals and objectives for students with autism, the physical educator should conduct assessments that will provide information on the student's abilities and interests which can be used to develop the IEP (Houston-Wilson, 2005). The special education teacher can also assist in advising the physical educator of the student's abilities and any instructional or behavioral strategies that are being implemented. For example, if the student is using PECS in the classroom, the physical educator can familiarize themselves with the system and implement it in physical education. In addition to assessments, ongoing evaluations need to be conducted to determine students progress and ensure the goals and objects are appropriate to the students needs (Heflin & Simpson, 1998; Simpson & Myles, 1996). Facilitating successful outcomes for students with ASD requires proper planning in developing and implementing an individualized program that meets the needs of the student needs (Schwartz, Sandall, McBride, & Boulware, 2004; Simpson, 2005).

The physical education atmosphere can cause sensory overload for a child with autism (Houston-Wilson & Lieberman, 2003). Therefore, physical educators need to provide an organized and predictable environment for students (Houston-Wilson & Lieberman, 2003). This can be accomplished by creating routines and activity schedules (Bryan & Gast, 2000; Groft-Jones & Block, 2006; Hodgdon, 1995; Mesibov, 2004, 2006; Schopler & Mesibov, 1994), using visual supports (Dettmer et al., 2000; Heflin & Simpson, 1998; Mesibov, 2006; Quill, 1995, 1997), and concrete boundaries (Groft-Jones & Block, 2006; Schopler, Mesibov, & Hearsey, 1995).

A few facts that need to be taken into consideration when teaching individuals with ASD are: (1) individuals with autism are visual learners; they see words in pictures, compared to hearing them, basically individuals with autism process visual information more efficiently than auditory information (Temple Grandin, 1995; Hermelin & O'Connor, 1970; Cohen, 1998; Quill, 1995, 1997; Tissot & Evans, 2003) and (2) educators are responsible for meeting the needs of all students while providing a safe environment that facilitates learning. Therefore, when teaching students with autism, educators need to take into consideration the characteristics associated with autism and determine the instructional techniques that support the individual learning style of the student with ASD (Groft-Jones & Block, 2006; Mesibov & Shea, 1996; Tissot & Evans, 2003; Quill, 1997). Teachers must also note that individuals with ASD have a wide variety of needs and abilities that require specialized individual instructional techniques (Mesibov & Shea, 1996; Tissot & Evans, 2003). When considering effective strategies in teaching students with autism one must be aware that no two individuals with autism are the same (Groft-Jones & Block, 2006; Mesibov & Shea, 1996). However, it is beneficial to focus on the strengths of individuals with autism, which is that they are extremely visual; their world is heard in seeing pictures.

The results of this research support Hodgdon (1999) statement regarding individuals with ASD not understanding the world around them, “They tend to be visual learners living in a very auditory world” (p.65).

Suggestions for Future Research and Implications

Considering there is a lack of empirical evidence regarding instructional strategies for students with ASD in physical education, future researchers could (1) examine the

effects of time-on-task behaviors on students with ASD when visual supports are implemented by a peer tutor, (2) determine the effects of training physical education teachers and aids on the characteristics of students with ASD and how to implement the use of visual supports on their perceptions of teaching students with ASD, (3) examine the perceptions of students without disabilities in an inclusive physical setting with students with ASD.

In addition to implications for future research, the outcomes of this study offer implications for educators. Results suggest that visuals supports can be an effective method to increase time-on-task behaviors while decreasing time-off-task and assisted task behaviors of students with ASD. Visual supports are inexpensive and can be easily implemented, which also provides educators with a valid means of meeting the needs of students with ASD (Bryan & Gast, 2000; Dettmer et al., 2000).

Conclusions

Despite the limitations, this study is the first empirical evidence to contribute to the use of visual supports for students with ASD in an inclusive physical education setting. The purpose of this study was to indicate the effects of the use of visual supports on (1) time-on-task, (2) time-off-task, and (3) assisted task behavior for students with autism during inclusive physical education. The results of this study indicate visual supports can increase students with ASD time-on-task behaviors, while decreasing off-task behaviors and the need for assistance, which ultimately increases independence.

Autism, this one word has a tremendous impact on parents, teachers, and especially the individual. Autism is the fastest growing developmental disability, every 21 minutes another child is diagnosed with Autism (Cure Autism Now, 2006).

Individuals with autism have an unpredictable world, they are not sure of what comes next in their daily lives, nor do they have an understanding of what to do or when to do it due to deficits in communication which causes anxiety and confusion, which then causes withdrawal and disruptive and self-stimulatory behaviors (Collier & Reid, 2003; Jones & Block, 2006; Mesibov & Shea, 1996). The symbol for autism is a puzzle as it is a puzzling disability in that the etiology is unknown and it affects each individual differently and at varying degrees. Although there is no one best teaching method when teaching students with ASD it is beneficial to focus on what is known about the strengths and processing methods of students with ASD (Simpson, 2005). As indicated by the results of this study, visual supports can aid in facilitating learning by increasing time-on-task behaviors while decreasing time-off-task and assisted task behaviors of students with autism in inclusive physical education.

Limitations

The researcher acknowledges that the physical education sessions were conducted in the perfect environment, each session was instructed by a physical education teacher who was also a certified adapted physical educator and class sizes were relatively small consisting of total 12-15 students. However, this also suggests that some students with ASD require smaller inclusive class settings that also implement teaching strategies that focus on their strengths.

This study was subject to the following limitations:

1. Participants were not representative of a large population.
2. Possible side effects of prescribed medication influenced behavior and performance of the students with autism.

3. Possible effects of maturation on student behavior at school.
4. Possible effects of home life on students with autism behavior at school.
5. Inadvertent influence that the researcher may have had on the participants.
6. Changes in the students with autism daily routine that may have influenced their behavior.

Delimitations

1. Four students with ASD were purposively selected from the Thomasville School District, in September 2006.
2. Students met the following criteria for inclusion in this study: (a) identified as autistic by the DSM-IV-TR and CARS; (b) had stereotypical behaviors; (c) attended general physical education classes.
3. Each student's performance was observed and analyzed at least 7 times. Each session consisted of 20 – 30 minutes of reversed mainstreamed physical education.
4. Each student had 11 intervention sessions.
5. Each students performance was analyzed in 6 second intervals to determine if the student was on-task, off-task, or modified task.

REFERENCES

American Psychiatric Association (APA). (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., Text Revision). Washington, DC: Author.

Auxter, D., Pyfer, J., & Huettig, C. (2005). *Principles and methods of adapted physical education and recreation (10th ed.).* New York, NY: McGraw-Hill.

Block, M. E. (2003). Inclusion: Common problems – practical solutions. *Teaching Elementary Physical Education, 14*(3), 6.

Blubaugh, N., & Kohlmann, J. (2006). TEACCH model and children with autism. *Teaching Elementary Physical Education, 17*(6), 16-19.

Bondy, A. (2001). PECS: Potential benefits and risks. *The Behavior Analyst Today, 2*, 127-132.

Bondy, A., & Frost, L. (1994). The picture exchange communication system. *Focus on Autistic Behavior, 9*(3), 1-19.

Bondy, A., & Frost, L. (2001). The picture exchange communication system. *Behavior Modification, 25*(5), 725-744.

Boucher, J., & Lewis, V. (1989). Memory impairments and communication in relatively able autistic children. *Journal of Child Psychology and Psychiatry, 30*, 90-122.

Broun, T. L. (2004). Teaching students with autistic spectrum disorder to read: A visual approach. *TEACHING Exceptional Children, 36*(4), 36-40.

Bryan, L. C., & Gast, D. L. (2000). Teaching on-task and on-schedule behaviors to high-functioning children with autism via picture activity schedules. *Journal of Autism and Developmental Disorders, 30*(6), 553-567.

Centers for Disease Control (CDC) (2007). Prevalence of the Autism Spectrum Disorders in Multiple Areas of the United States, Surveillance Years 2000 and 2002. Retrieved on February 10, 2007 at http://www.cdc.gov/ncbddd/dd/addmprevalence.htm

Charlop-Christy, M. H., Carpenter, M., Le, L., LeBlanc, L. A., & Kellet, K. (2002). Using the picture exchange communication system (PECS) with children with autism: Assessment of PECS acquisition, speech, social-communicative behavior, and problem behavior.

Cohen, S. (1998). *Targeting autism: What we know, don't know, and can do to help young children with autism.* Berkley, CA: University of California Press.

Collier, D., & Reid, G. (2003). The autism spectrum disorders. *Palaestra, 19*(3), 36-46.

Cooper, J. O., Heron, T. E., & Heward, W. L. (Eds.). (1987). *Applied behavior analysis.* Columbus, OH: Merrill.

Coucouvanis, J. (1997). Behavioral intervention for children with autism. *Journal of Child and Adolescent Psychiatric Nursing, 10*(1), 37-44.

Crozier, S., & Sileo, N. (2005). Encouraging positive behavior with social stories. *TEACHING Exceptional Children, 37*(6), 26-31.

Cure Autism Now (CAN) (2006). Autism resources: FAQs about autism. Retrieved on February 10, 2007 at

http://www.cureautismnow.org/site/c.bhLOK2PILuF/b.1311643/k.98D1/FAQs_About_Autism.htm

Dalrymple, N. (1995). Environmental supports to develop flexibility and independence. In K. A. Quill (Ed.), *Teaching children with autism: Strategies to enhance socialization and communication* (pp. 243-264). Albany, NY: Delmar.

DeMyer, M. K. (1975). The nature of neuropsychological disability in autistic children. *Journal of Autism and Childhood Schizophrenia, 5*, 109-128.

Dettmer, S., Simpson, R., Myles, B., &Gantz, J. (2000). The use of visual supports to facilitate transition of students with autism. *Focus on Autism and Other Developmental Disabilities, 15*(3), 163-169.

Earles, T., Carlson, J., & Bock, S. (1998). Instructional strategies to facilitate successful learning outcomes for students with autism. In R. Simpson & B. Myles (Eds.), *Educating children and youth with autism: Strategies for effective practices* (pp. 55-111). Austin, TX: PRO-ED.

Groft-Jones, M., & Block, M. E. (2006). Strategies for teaching children with autism in physical education. *Teaching Elementary Physical Education, 17*(6), 25-28.

Gray, C. A., & Garand, J. D. (1993). Social stories: Improving responses of students with autism with accurate social information. *Focus on Autistic Behavior, 8*(1), 1-10.

Grandin , T. (1995). *Thinking in pictures: And other reports from my life with autism.* New York: Doubleday.

Hall, L. J., McClannahan, L. E., & Krantz, P. J. (1995). Promoting independence in integrated classrooms by teaching aides to use activity schedules and decrease

prompts. *Education and Training in Mental Retardation and Developmental Disabilities, 30,* 208-217.

Hamlin, T. (2005). The discovery way. *The Exceptional Parent, 35*(9), 78-81.

Heflin, L. J., & Simpson, R. L. (1998). Interventions for children and youth with autism: Prudent Choices in a world of exaggerated claims and empty promises. Part I: Intervention and treatment option review. *Focus on Autism and Other Developmental Disabilities, 13*(4), 194-211

Hermelin, B., & O'Conner, N. (1970). *Psychological experiments with autistic children.* London: Pergamon.

Hodgdon, L. Q. (1995). Solving social-behavioral problems through the use of visually supported communication. In K. A. Quill (Ed.), *Teaching children with autism: Strategies to enhance communication and socialization* (pp. 265-286). New York: Delmar.

Hodgdon, L. (1999). *Solving Behavior Problem in Autism: Improving Communication with Visual Strategies.* Troy, MI: Quirk Roberts Publishing.

Houston-Wilson. C. (2005). Pervasive developmental disorders. In J. P. Winnick (Eds.), *Adapted physical education and sport* (*4th ed.,* pp. 173-188). Champaign, IL: Human Kinetics.

Houston-Wilson, C., & Lieberman, L. J. (2003). Strategies for teaching students with autism in physical education. *Journal of Physical Education, Recreation and Dance, 74*(4), 40-44.

Igo, M., French, R., & Kinnison, L. (1997). Influence of modeling and selected reinforcement on improving cooperative play skills of children with autism. *Clinical Kinesiology, 51*(1), 16-20.

Johnston, S., Nelson, C., Evans, J., & Palazolo, K. (2003). The use of visual supports in teaching young children with autism spectrum disorder to initiate interactions. *Augmentative and Alternative Communication, 19*(2), 86-103.

Jolly, A. C., Test, D. W., & Spooner, F. (1993). Using badges to increase initiations of children with sever disabilities in a play setting. *Journal of the Association for Persons with Sever Handicaps, 18*(1), 46-51.

Jones, K. J., & Block**,** M. E. (2006). Including an autistic middle school child in general physical education: A case study. *Strategies: A Journal for Physical and Sport Educators*, *19*(4), 13-16.

Kimball, J., Kinney, E., Taylor, B., & Stromer, R. (2003). Lights, camera, action! Using engaging computer-cued activity schedules. *TEACHING Exceptional Children, 36*(1), 40-45.

Kimball, J., Kinney, E., Taylor, B., & Stromer, R. (2004). Video enhanced activity schedules for children with autism: A promising package for teaching social skills. *TEACHING Exceptional Children, 27*(3), 280-298.

Kluth, P., & Darmody-Latham, J. (2003). Beyond sight words: Literacy opportunities for students with autism. *Reading Teacher*, *56*(6), 532-535.

Krantz, P. J. & McClannahan, L. E. (1993). Teaching children with autism to initiate to peers: Effects of a script-fading procedure. *Journal of Applied Behavior Analysis, 26*(1), 121-132.

LaMaster, K., Gall, K., Kinchin, G., & Siedentop, D. (1998). Inclusion practices of effective elementary specialists. *Adapted Physical Activity Quarterly, 15*(1), 64-81.

Layton, T. L., & Watson, l. R. (1995). Enhancing communication in nonverbal children with autism. In K. A. Quill (Ed.), *Teaching children with autism: Strategies to enhance communication and socialization* (pp. 73-101). Albany, NY: Delmar.

Lieberman, J. L., Dunn, J. M., van der Mars, H., & McCubbin, J. (2000). Peer tutors' effects on activity levels of deaf students in inclusive elementary physical education. *Adapted Physical Activity Quarterly, 17*, 20-39.

Lienert, C., Sherrill, C., & Myers, B. (2001). Physical educators' concerns about integrating children with disabilities: A cross-cultural comparison. *Adapted Physical Activity Quarterly, 18*(1), 1-17.

Lincoln, A., Courchesne, E., Kilman, B., Elmasian, R., & Allen, M. (1988). A study of intellectual abilities in high-functioning people with autism. *Journal of Autism and Developmental Disorders, 18*, 505-523.

Lisboa, F. L. F. (1995). ALT-PE by children with autism placed in regular, reversed mainstreamed, and adapted physical education classes. *Perceptual and Motor Skills, 80*, 553-334.

MacDuff, G., Krantz, P., & McClannahan, L. (1993). Teaching children with autism to use pictographic activity schedules: Maintenance and generalization of complex response chains. *Journal of Applied Behavior Analysis, 26*, 89-97.

Mangus, B. C., Henderson, H., & French, R. (1986). Implementation of a token economy by peer tutors to increase on-task physical activity time of autistic children. *Perceptual and Motor Skills, 63*, 97-98.

Massey, N. G., & Wheeler, J. J. (2000). Acquisition and generalization of activity schedules and their effects on task engagement in a young child with autism in an Inclusive Pre-School Classroom. *Education and Training in Mental Retardation and Developmental Disabilities, 35*(3), 326-335.

Mechling, L. C., & Gast, D. L. (1997). Combination audio/visual self-prompting system for teaching chained tasks to students with intellectual disabilities. *Education and Training in Mental Retardation, 32*, 138-153.

Mesibov, G. (2006). What is TEACCH? Retrieved December 28, 2006 from http://www.teacch.com/whatis.html

Mesibov, G. B., & Shea, V. (1996). Full inclusion and students with autism. *Journal of Autism and Developmental Disorders, 26*(3), 337-346.

Metzler, M. (1989). A review of research in time in sport pedagogy. *Journal of Teaching in Physical Education, 8*, 87-103.

Mirenda, P., & Santogrossi, J. (1985). A prompt-free strategy to teach pictorial communication system use. *Augmentative and Alternative Communication, 1*, 143-150.

Morrison, R. S., Sainato, D. M., BenChaaban, D., & Endo, S. (2002). Increasing play skills of children with autism using activity schedules and correspondence training. *Journal of Early Intervention, 25*, 58-72.

National Center on Physical Activity and Disability (2004). General exercise guidelines. Retrieved February 27, 2005 from http://www.ncpad.org/exercise/fact_sheet.php?sheet=15

National Information Center for children and youth with Disabilities (NICHCY), (2006). *Autism and pervasive developmental disorder: Fact sheet 1.* Retrieved March 21, 2007, from http://www.nichcy.org/pubs/factshe/fs1txt.htm.

Odom, S. L., Brown, W. H., Frey, N. K., Smith-Canter, L. L., & Strain, P. S. (2003). Evidence-based practices for young children with autism: Contributions for single-subject design research. *Focus on Autism and Other Developmental Disabilities, 18*(3), 166-175.

Parker, M. (1989). Academic Learning Time-Physical Education (ALT-PE), 1982 revision. In P. W. Darst, D. B. Zakrajsek, & V. H. Mancini (Eds.), *Analyzing Physical Education and Sport Instruction* (pp. 195-205). Champaign, IL: Human Kinetics.

Prior, M., & Chin, C. (1976). Short-term and serial memory in autistic, retarded, and normal children. *Journal of Autism and Childhood Schizophrenia, 6,* 121-131.

Quill, K. A. (1995). Visually cued instruction for children with autism and pervasive developmental disorders. *Focus on Autistic Behavior, 11,* 10-22.

Quill, K. A. (1997). Instructional considerations for young children with autism: The rationale for visually cued instruction. *Journal of Autism and Developmental Disorders, 27*(6), 697-714.

Rao, S. M., & Gagie, B. (2006). Learning through seeing and doing: Visual supports for children with autism. *TEACHING Exceptional Children, 38*(6), 26-33.

Rink, J. E. (1993). *Teaching physical education for learning (2nd ed.).* St. Louis, MO: Mosby.

Savner, J. L., & Myles, B. S. (2000). *Work in the home and community: Strategies for individuals with autism and asperger syndrome.* Shawnee Mission, K.S.: Autism-Asperger Publishing Co.

Schmit, J., Alper, S., Raschke, D., & Ryndak, D. (2000). Effects of using photographic cueing package during routine school transitions with a child who has autism. *Mental Retardation, 38*(2), 131-137.

Schopler, E., Mesibov, G. B., & Hearsey, K. (1995). Structured teaching in the TEACCH system. In E. Schopler & G. B. Mesibov (Eds.), *Learning and cognition in autism* (pp.243-268). New York: Plenum.

Schopler, E., Reichler, R. J., & Rochen-Renner, B. R. (1988). *The Childhood Autism Rating Scale (CARS)*. Los Angeles, CA: Western Psychological Services, Inc.

Schultheis, S. F., Boswell, B.B., Decker, J. (2000). Successful physical activity programming for students with autism. *Focus on Autism & Other Developmental Disabilities, 15*(3), 159-162.

Schwartz, I., Garfinkle, A., & Bauer, J. (1998). The picture exchange communication system: Communicative outcomes for young children with disabilities. *Topics in Early Childhood Special Education, 18*(3), 144-159.

Schwartz, I. S., Sandall, S. R., McBride, B. J., & Boulware, G. L. (2004). Project DATA (Developmentally appropriate treatment for autism): An inclusive school-based approach to educating young children with autism. *Topics in Early Childhood Special Education, 24*(3), 156-168.

Sharpe, T., & Koperwas, J. (1999). *BEST: Behavioral Evaluation Strategy and Taxonomy Software.* Thousand Oaks, CA: SAGE.

Sherrill, C. (2004). *Adapted physical activity, recreation, and sport; Crossdisciplinary and lifespan* (6th ed.). New York, NY: McGraw-Hill.

Siedentop, D. (1983). Academic learning time: Reflections and prospects. *Journal of Teaching in Physical Education, 2*, 3-7.

Siegel, J., Minshew, N., & Goldstein, G. (1996). Wechsler IQ profiles in diagnosis of high-functioning autism. *Journal of Autism and Developmental Disorders, 26*(4), 389-406.

Sigman, M., Dissanayake, C., Arbelle, S., & Ruskin, E. (1997). Cognition and emotion in children and adolescents with autism. In D. J. Cohen & F. R. Volkmar (Eds.), *Handbook of autism ad pervasive developmental disorders* (2nd edn., pp. 248-265). New York: John Wiley & Sons.

Simpson, R. L. (2005). Evidence-based practices and students with autism spectrum disorder. *Focus on Autism and Other Developmental Disabilities, 20*(3), 140-149.

Simpson, R. L., de Boer-Ott, S. R., & Smith-Myles, B. (2003). Inclusion of learners with autism spectrum disorders in general education settings. *Topics in Language Disorders, 23*(2), 116-133.

Simpson, R. L. & Myles, B. S. (1996). The general education collaboration model: A model for successful mainstreaming. *Focus on Exceptional Children, 23*(4), 1-10.

Simpson, R. L., & Myles, B. S. (1998). Aggression among children and youth who have Asperger's syndrome: A different population requiring different strategies. *Preventing School Failure, 42*(4), 149-153.

Staveren, T. V., & Dale, D. (2004). Childhood obesity problems and solutions. *Journal of Physical Education, Recreation & Dance, 75*(7), 44-49.

Temple, V. A., & Walkley, J. W. (1999). Academic learning time-physical education (ALT-PE) of students with mild intellectual disabilities in regular Victorian schools. *Adapted Physical Activity Quarterly, 16*, 64-74.

Tissot, C., & Evans, R. (2003). Visual teaching strategies for children with autism. *Early Child Development and Care, 173*(4), 425-433.

van der Mars, H. (1989a). Basic Recording Tactics (Eds.), *Analyzing Physical Education and Sport Instruction* (pp. 19-51). Champaign, IL: Human Kinetics.

van der Mars, H. (1989b). Observer Reliability: Issues and procedures (Eds.), *Analyzing Physical Education and Sport Instruction* (pp. 53-80). Champaign, IL: Human Kinetics.

Vogler, E. W., van der Mars, H., Cusimano, B., & Darst, P. (1992). Experience, expertise, and teaching effectiveness with mainstreamed and nondisabled children in physical education. *Adapted Physical Activity Quarterly, 9*, 316-329.

Weber, R. C., & Thorpe, J. (1992). Teaching children with autism through task variation in physical education. *Exceptional Children, 59*(1), 77-86.

Winnick, J. P. (2005). *Adapted physical education and sport (4th ed.).* Champaign, IL: Human Kinetics.

Wolfberg, P., & Schuler, A. (1993). Integrated play groups: A model for promoting the social and cognitive dimensions of play. *Journal of Autism and Developmental Disorders, 23*, 1-23.

Zanolli, K., Daggett, J., & Adams, T. (1996). Teaching preschool age autistic children to make spontaneous initiations to peers using priming. *Journal of Autism and Developmental Disorders, 26*(4), 407-422.

APPENDICES

APPENDIX A

INFORMED CONSENT FORM

Beauregard Elementary School

Beauregard Elementary School

September 2006

To Whom It May Concern:

The letter is to grant permission to Jeanine Fittipaldi-Wert and Auburn University to conduct research at Beauregard Elementary School in Opelika, Alabama.

I am aware that the purpose of the research being conducted at Beauregard Elementary School is to examine the effects of visual supports on individuals with autism in physical education.

I am aware that data collection methods will include videotaping of each physical education class taught by Jeanine Fittipaldi-Wert. All participant data will remain confidential and viewed by Jeanine Fittipaldi-Wert until destroyed.

I understand that research procedures will be explained to all participants (and their parents/guardians) and participants will be asked to sign consent/assent forms identifying their willingness to participate. I also understand that all participants have the right to withdraw from this research at anytime, and participation/lack of participation will not jeopardize future relations or opportunities with Jeanine Fittipaldi-Wert, Auburn University.

I offer my full cooperation in this project.

Sincerely,

Thomas S. Miller
Principal

APPENDIX B

INFORMED CONSENT / CHILD ASSENT

INFORMED CONSENT / CHILD ASSENT
FOR A RESEARCH STUDY ENTITLED,
"The Effects of Visual Supports in Inclusive Physical Education For Students with Autism"

Your child is invited to participate in a research study at Beauregard Elementary School during their physical education class. The purpose of this study is to examine the effects of using pictures to describe activities to students with autism in physical education class. This study is being conducted by Jeanine Fittipaldi-Wert, (who is already assisting in physical education at Beauregard as part of her graduate assistantship) under the supervision of Dr. Peter Hastie & Dr. Sheri J. Brock from Auburn University in Alabama.

We hope to learn how the use of pictures in physical education can improve the learning experience for your child in physical education. Beauregard Elementary students have been selected to participant in this study because your child has been diagnosed with autism and your child is familiar with Ms. Wert.

If you allow your child to participate, we will collect data by videotaping 40 physical education lessons. Please be advised that your child will continue to attend their scheduled physical education class.

There are no risks or discomforts associated with participation in this study.

We hope to learn how the use of pictures improves participation, effort, enjoyment, independence, motivation, and physical skills during physical education for students with autism.

We cannot promise that you will receive any or all of the benefits described.

Any information obtained in connection with this study and that can be identified with your child will remain confidential. Investigators involved in the project will have access to participant's data as identified by student number and all data will be destroyed after it is analyzed. Information collected through your child's participation may be used for publication in a professional journal and/or presented at a professional meeting. If so, none of your child's identifiable information will be included. Your child may withdraw from participation of the study at any time, without penalty, however, after the tapes have been analyzed and destroyed, they will be unable to withdraw their data since there will be no way to identify individual information.

 Parents/Guardian's Initials _____

Your decision whether or not to allow your child to participate will not jeopardize your future relations with Auburn University, or Beauregard Elementary School.

If you have any questions we, invite you to ask them now. If you have questions later, please contact Dr. Sheri J. Brock at 334 844-1464 or email brocksj@auburn.edu and we will be happy to answer them. You will be provided a copy of this form to keep.

For more information regarding your childs' rights as a research participant you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334)-844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO PARTICIPATE.

_____	_____
Participant's signature Date	Investigator obtaining consent Date
_____	Jeanine Fittipaldi-Wert
Print Name	Print Name
_____	_____
Parent's or Guardian Signature Date	Co-investigator's signature Date
_____	Dr. Sheri J. Brock
Print Name	Print Name

APPENDIX C

INTERVAL RECORDING SHEET

Interval Recording Scoresheet

Student: ____________________

Date: ___________

Totals: On-Task: ______________

Off-Task: ______________

Assisted-Task: __________

6	12	18	24	30	36	42	48	54	60	.06	.12	.18	.24	.30	.36	.42	.48	.54	.60

6	12	18	24	30	36	42	48	54	60	.06	.12	.18	.24	.30	.36	.42	.48	.54	.60

6	12	18	24	30	36	42	48	54	60	.06	.12	.18	.24	.30	.36	.42	.48	.54	.60

6	12	18	24	30	36	42	48	54	60	.06	.12	.18	.24	.30	.36	.42	.48	.54	.60

6	12	18	24	30	36	42	48	54	60	.06	.12	.18	.24	.30	.36	.42	.48	.54	.60

6	12	18	24	30	36	42	48	54	60	.06	.12	.18	.24	.30	.36	.42	.48	.54	.60

6	12	18	24	30	36	42	48	54	60	.06	.12	.18	.24	.30	.36	.42	.48	.54	.60

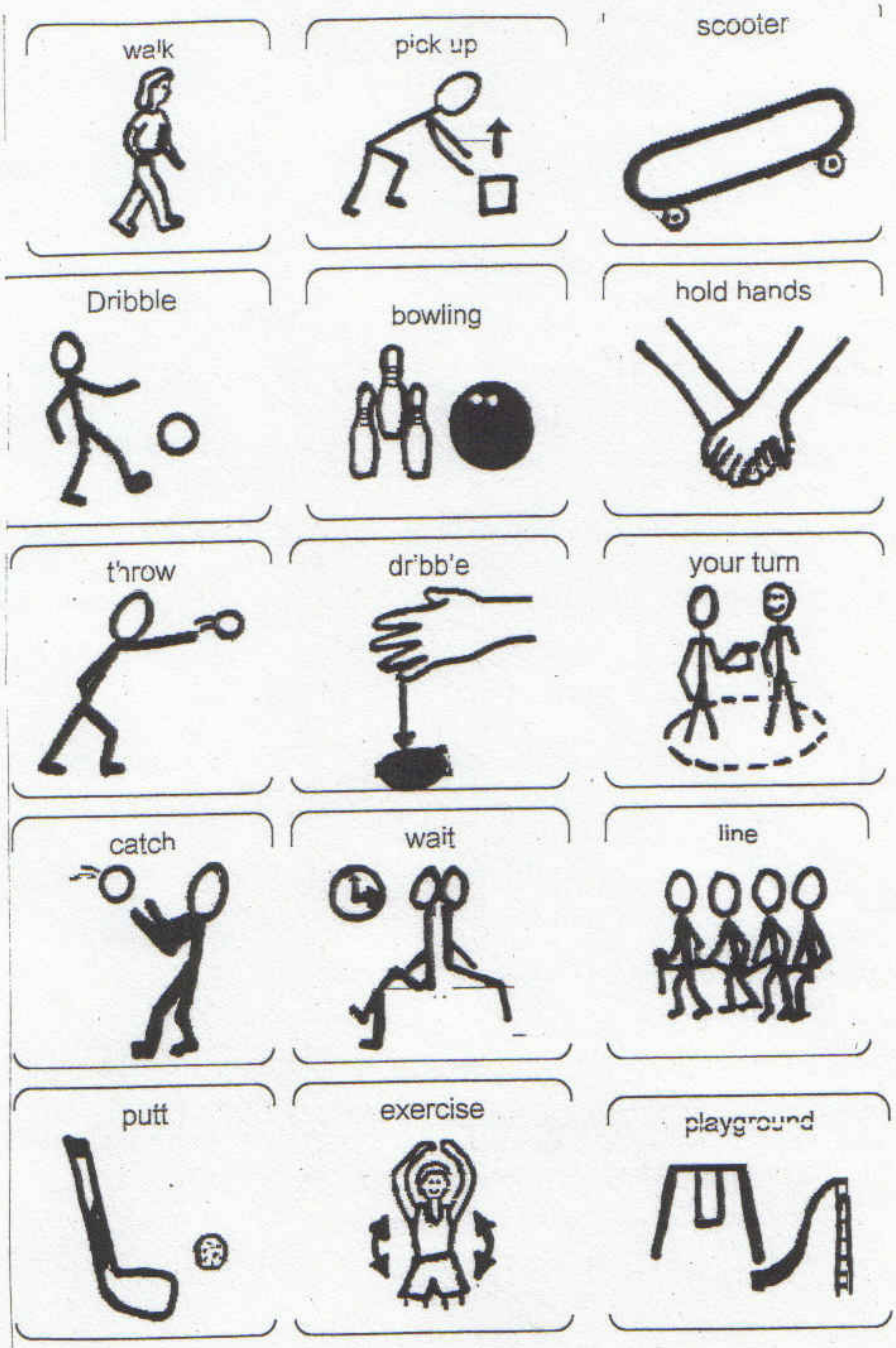
6	12	18	24	30	36	42	48	54	60	.06	.12	.18	.24	.30	.36	.42	.48	.54	.60

6	12	18	24	30	36	42	48	54	60	.06	.12	.18	.24	.30	.36	.42	.48	.54	.60

On-Task (☑)	**Off-Task** (O)	**Assisted-Task** (A)
Performed Task	**Did Not Perform Task**	**Physically Assisted By Aid or Teacher**

APPENDIX D

Picture Exchange Communication System (PECS)


walk
pick up
scooter
Dribble
bowling
hold hands
throw
dribble
your turn
catch
wait
line
putt
exercise
playground

APPENDIX E

Copy Right Approval for

Picture Exchange Communication System (PECS)

From:	"Lori Geist" <lori@mayer-johnson.com>	Thursday - March 22, 2007 7:41 PM
To:	<wertjea@auburn.edu>	
Subject:	RE: PCS Permission	
Attachments:	Mime.822 (3737 bytes) [Save As]	

Hi Jeanine,

Please use the Picture Communication Symbols (PCS) with our permission.
Please include the following copyright where appropriate:

Picture Communication Symbols C1981-2006 by Mayer-Johnson LLC. All Rights Reserved Worldwide. Used with permission.

Kind regards,

Lori

_____

Lori Geist, MS, CCC-SLP
Product Manager, Content and Development
Mayer-Johnson LLC
www.mayer-johnson.com
lori@mayer-johnson.com
800.588.4548 x131

-----Original Message-----
From: wertjea@auburn.edu [mailto:wertjea@auburn.edu]
Sent: Thursday, March 22, 2007 7:47 AM
To: Lori@mayer-johnson.com
Subject: PCS Permission

Jeanine Fittipaldi-Wert
Auburn University
1010 A North 1st Street
Opelika, AL 36801
United States

Phone: 215 872-3575
Fax: 334 844-1467
Website: http://education.auburn.edu/academic_departments/hhp/index.html
Email: wertjea@auburn.edu

Description: I am conducting research for a dissertation for a PhD at Auburn University, Auburn, AL. The topic is the effects of visual supports for

students with autism in an inclusive setting. Therefore, I am requesting permission to publish PECS picture examples in the dissertation and manuscripts that will be produced.

Number of PCS: n/a

Printed or Software: yes

Give or Sell: The final project is a disseration and manuscript that will be published. it will not be sold.

Percentage of PCS: n/a

Copies of Product: n/a

Other Info: