

Benefits of Using Target Activities to Assist in Improvement of Striking in Striking and  
Fielding Games for Individuals with Autism: A Comparative Case Study

Brittany Hogan, B. Ph. Ed.

Submitted for the completion of the requirements for the degree of  
Master of Arts in Applied Health Science  
(Health & Physical Education)

Supervisor: Ken Lodewyk, PhD.

Faculty of Applied Health Science  
Brock University  
St. Catharines, Ontario

Brittany Hogan © August 2013

## Acknowledgements

First, I want to say how thankful I am for all the people that supported me throughout my master's degree. Thank you to everyone in the graduate program for always being there when support was needed (especially those in 274A). To my sister turtles, thanks for always giving the support needed to make it through the long nights and many hours preparing lesson plans. Thank you for being unbelievable mentors in the Saturday Program and always helping out and demonstrating when needed, I owe you one. To the individuals that participated in the study, thank you for your willingness and eagerness to work with the participants and facilitate lesson plans each week- I know it was not easy. The time you spent participating in the study greatly impacted the research, as the overall aim was to add literature to the field of games skills and autism spectrum disorder and I am hopeful that this information will be used in the future.

To my committee members: Dr. Lorne Adams and Dr. Maureen Connolly. Lorne, I never got the opportunity to have you as a professor throughout my years at Brock University but I did get the opportunity to see you teach "The Last Lecture" and I have never been more inspired. Thank you for showing me what great teaching and passion looks like and I hope someday I can bring that same passion into my job. Maureen (a.k.a Mother Turtle) where do I begin in the journey? I can remember the first day that I walked into S.N.A.P, wondering "what in the heck did I get myself into?" there were kids running everywhere, screaming and crying and I was handed a profile and thought "no way". Here I am six years later and loving working with this population more than ever

and I owe you a thank you for that. You have continued to spark my passion over the years and are a true inspiration, nobody else could do it that's for sure. So again, thank you for all that you have done, it means the world to me. LYMI.

To Dr. Ken Lodewyk, it has been quite a journey and not an easy one at that. I cannot thank you enough for always being around when I needed support. I still remember the email you sent before I taught my first 4P00 class, you told me to not be nervous, to go in there with confidence because I was going to be great. You were the person I could always count on for the words of encouragement throughout the last two years. On top of all of that, watching you teach in lecture and labs is so inspiring, you really do want the best for the students and I can see your passion in every single class and I hope to one day emit that passion as well. Thank you for being there and supporting me throughout the master's process, it has been an absolute privilege to be your master student, I would not have wanted it any other way.

Last but not least, to my family, I know that you could not be here every step of the way but the support and encouragement that you gave me throughout helped me push through to the end. You have always wanted me to push myself and be the best that I can be and I truly believe you are the reason why I have achieved so many great things already. I cannot wait to see what else is out there for me after this achievement that I am so proud of.

### Abstract

The purpose of the research study was to increase understanding about the potential benefits of combining target activities with striking-fielding games for individuals with high functioning autism spectrum disorder. A comparative case study was conducted to understand if target activities can assist in improving the skills of striking and throwing, aid the learning of tactics, and add to current understanding of how certain teaching skills might be linked to the transfer between target and striking-fielding games. Data was collected through observations, student journals, and interviews and then analyzed using both inductive and deductive methods. Results showed signs of improvement in throwing, striking, bowling and badminton for overall skill levels. Appropriate and effective teaching techniques, effective equipment, dynamic participants and student-instructors, and consistency of attendance appear to be vital for such developments. Future research should further look at the transferability to outdoor settings and interview the participants.

## Table of Contents

Chapter I: INTRODUCTION.....	1
Chapter II: LITERATURE REVIEW.....	5
Autism and Physical Activity.....	5
Fundamental Movement Skills.....	8
Autism and Motor Development.....	9
Games.....	11
Striking-Fielding Games.....	13
Target Games.....	15
The Skill of Throwing.....	17
The Skill of Striking.....	20
Understanding Tactical Awareness.....	21
Teaching Skills.....	22
Chapter III: METHODOLOGY.....	28
Overview.....	28
Theoretical framework.....	29
Case Study.....	30
Participant Setting.....	33
General Procedure.....	34
Case Selection.....	35
Gaining Entry and Consent.....	36
Data Collection.....	38
Interviews.....	38

Observations.....	39
Field Notes.....	41
Data Analysis.....	44
Lesson Plans for each Participant.....	46
Trustworthiness.....	47
Researchers Role in Daily Structure.....	49
Chapter IV: FINDINGS.....	51
Phase 1: Within Case, Within Cohort Analysis.....	52
Research Question One.....	53
Research Question Two.....	53
Research Question Three.....	53
Phase 2: Across Case, Within Cohort.....	54
Research Question One.....	55
Theme 1: The appearance of improvement in throwing.....	55
Theme 2: The appearance of improvement in striking.....	60
Theme 3: The appearance of improvement in bowling.....	65
Theme 4: Enjoyment & engagement through planned activities...	67
Research Question Three.....	69
Theme 1: Appropriate and effective teaching techniques.....	70
Theme 2: Appropriate and affective equipment.....	76
Theme 3: Dynamic of the participants and student-instructors.....	81
Phase 3: Across Case, Across Cohort.....	83
Research Question One.....	83
Research Question Three.....	87

Summary of Results.....	89
Chapter V: DISCUSSION.....	93
Research Question One.....	95
Research Question Two.....	98
Research Question Three.....	98
Limitations.....	99
Future Directions.....	101
Conclusion.....	102
References.....	104
Appendices (A – V).....	114

## **Chapter I: INTRODUCTION**

Physical activity is reliant on the idea of physical fitness being multidimensional but which can be understood as a set of qualities that an individual can either be born with or acquire that helps in one's ability to perform physical activity within any movement setting (Horvat, Kalakain, Croce & Dahlstrom, 2011). Physical activity qualities may be different in individuals with disabilities, especially Autism Spectrum Disorder (ASD); yet, there are still major benefits for these individuals when partaking in physical activity just as in healthy individuals (Schultheis, Boswell & Decker, 2000). Along with some of the obvious such as obesity or heart disease, one of the most prominent reasons for having physical fitness is that it creates the independence of movement and allows for the ability to maintain or further develop functional skills. With this being said, individuals with disabilities have fewer programs available compared to the able-bodied population which makes participating in meaningful physical activity more challenging (Schultheis et al., 2000). Horvat et al. (2011) reported that limited opportunity in programming leaves less opportunity for these individuals to focus on areas such as motor skills which is one reason to explain why individuals with autism have such a wide range of ability. They add that individuals with autism require more research within a movement setting to be able to increase their movement repertoire in physical activity.

Autism spectrum disorder (ASD) is becoming more prevalent in society with diagnosis for children in the United States at 1 in every 110 children and still growing.

The rise in diagnosis is due to the increase in both awareness and improvements in screening (Kogen et al., 2009). The two most prevalent types of ASD are autism and Asperger's disorder; these are also the two main types that would be encountered in an educational or movement setting (Horvat et al., 2011). Children with autism are typically diagnosed before the age of three based on early development difficulties including such things as having trouble speaking, responding to sensory stimulus and other development discrepancies (Houston-Wilson & Leiberan, 2003). It is important to remember that in the movement setting no one individual with autism is the same; resulting in the need for physical activity plans that have to be tailored to the specific individual (Horvat et al., 2011).

There has been heightened interest in ASD by researchers over the last few years but there is still no real connection between ASD and aspects of physical activity. There is a general understanding of the importance of physical fitness on well-being within these individuals but not on teaching the required skills necessary to be able to participate in a variety of game forms. Being able to perform skills and tactics from one game often enables transfer of those to other games and other aspects of life. This research study endeavors to make the larger connection between teaching skills in individuals with ASD so they can participate in a greater variety of activities. Research has tried to find a way to create meaningful movement opportunities for these individuals to increase their movement repertoire through a variety of games and game forms, allowing for success.

Games can be one of the ways to teach a variety of skills and tactics that can transfer to other game forms and a variety of aspects of life (Mitchell, Oslin & Griffin,

2006). Almond (1986) defined four games categories: invasion, net/wall, striking-fielding (S-F) and target games; however, for individuals with autism, striking and fielding games (SFG) can be one of the best ways in teaching skills as they have the opportunity to become more successful (Fisette & Mitchell, 2010). Teaching target games might complement the teaching of SFG as there are many similarities in the content of these two game categories. Fisette and Mitchell (2010) state that just like striking-fielding, target games allow for more preparation time in both the set-up and pre-shot phases compared to other games categories. This means that an individual with autism can take his or her time before hitting the object allowing for a longer period of time to accurately execute the skill. Targeting games also work on fundamental skills such as aim, accuracy and how to protect a target (Wall & Murray, 1994) and provide individuals with autism meaningful opportunities to achieve success.

The topic of this thesis was chosen with the hope of being able to contribute to the body of qualitative research literature and to meet a personal desire to tell the story of one group of individuals with ASD. The general aim of this research is to increase understanding about the potential benefits of combining target activities with SFG for individuals between the ages of 12 to 16 with high functioning autism spectrum disorder. The guiding research questions are to determine whether target activities appear to (1) assist in improving the skills of striking and throwing in SFG (2) aid the learning of tactics for SFG while also (3) adding to current understanding about how the practice of certain teaching skills might be linked to the transfer of these skills and tactics between target and SFG. These research questions are important in answering for individuals with ASD, if target activities aid in teaching the skills necessary in SFG it could be a way in

which to allow for a greater opportunity for these individuals to participate in a wide range of game forms. SFG are one of the game forms that have the potential for individuals with ASD to be successful at compared to faster paced games such as invasion games.

## **Chapter II: LITERATURE REVIEW**

This chapter provides a better understanding of the literature pertaining to the potential benefits of combining both target and SFG for individuals with ASD. First, this chapter gives insight into how ASD is diagnosed helping to create the link to the implications that it brings in the movement setting. Continuing on, the review focuses on the concept of fundamental movement skills (FMS) in physical activity within the able-bodied population and then compares that to individuals with autism. This will help to not only understand FMS in individuals with autism but also their motor development; all these factors then assist in being able to create appropriate, meaningful and improved movement. The literature then progresses through explaining the concept of games before moving into the specifics of SFG and target games, as they are a key component to being able to answer the stated objectives. The literature review further goes on to explain the skill of throwing and striking by first explaining what the skill should look like in an able-bodied individual and how someone might progress the skill and then gives insight into individuals with ASD. Lastly, the review explains some of the strengths and weaknesses associated with various teaching styles that are used in the classroom and movement setting.

### **Autism and Physical Activity**

Understanding ASD and how it relates to physical activity is essential in being able to achieve the desired objectives. The first area to comprehend is that autism covers a wide range of individuals with cognitive, communication and social deficiencies (Rouse, 2009). According to the American, Individuals with Disabilities Education Act

Amendments of 1997, autism is classified as being a developmental disability that is both severe and chronic, which largely affects an individual's behaviour. Typically, it is diagnosed before the age of three by the difficulties observed during the early development stages. This may mean that the child struggles with speech, relating to others or objects, responding to sensory stimulus and has developmental discrepancies (Houston-Wilson & Lieberman, 2003). This specific developmental disorder is present, on average, in 1 in every 110 children in the United States and is continuing to grow at a steady rate due to both an increase in awareness as well as improved screening (Kogan et al., 2009). In relation to learning and cognition, children with autism have more predictable behaviour than other individuals classified with a developmental disorder as well as individuals without disabilities (Houston-Wilson & Lieberman, 2003). Moreover, it is called a "spectrum" because there are individuals that are considered high-functioning as there may only be one or two minor behaviour issues; but, there are also individuals with autism that have limited language skills, do not speak, or speak in repetitive phrases. This means that what works for one person may not work for another and sometimes a task that works one day may not work with the same child the next day (Rouse, 2009). In regards to the individuals that are high functioning, there are no real diagnostic guidelines to define high functioning autism (HFA). The most common way of diagnosing HFA is the total IQ ranging from 65-70 (Gillberg, 1998). When comparing HFA to Asperger's syndromes (AS), which are a part of the five pervasive development disorders, individuals with AS typically are considered higher functioning. This is due to more prominent characteristics such as abnormal social control and apraxia are shown in individuals with HFA (Gillberg, 1998).

Research shows that physical activity has benefits for children with disabilities, yet there are few programs available for children with autism (Schultheis et al., 2000). Meaning that these individuals do not have the same opportunities able-bodied individuals have in working and improving upon their movement skill set. A main issue of the physical education classroom and movement setting is that it is not adapted to accommodate for maximum instruction of all individuals. For children with autism to have success in the classroom, certain aspects have to be adapted. A program known as the Treatment and Education of Autistic and Related Communications-Handicapped Children (TEACCH) focuses on improving the environments for success (Schopler & Mesibov, 1994). To improve the environments, both modification and restructure are necessary to accommodate the unique characteristics that accompany autism. There are many components of the TEACCH model, however, there is an emphasis on physical fitness and motor ability which includes areas such as strength, flexibility, throwing, kicking, locomotor and balance (Schultheis et al., 2000). These are all areas of the child's movement repertoire that need improvement; yet a significant problem is that physical activity is often not administered appropriately to children with disabilities. The recommended proportion of physical activity within a physical education class is at least 50% of the time; however, students with disabilities are receiving far less than the expected number for typically developing individuals (Pan, Tsai & Hsieh, 2011). Individuals with autism spend more time in moderate to vigorous physical activity (MVPA) during class time than during recess (Pan, 2008). It is evident that physical activity is lacking in the classroom not just for the able-bodied population but also for children with disabilities. Understanding the literature on the classroom can help to

structure a movement setting as to know where improvements need to be made because of the issues presented in the classroom.

### **Fundamental Movement Skills**

In typical developing children, motor development is dependent on how the child grows and matures and this is also true for children with autism (Malina, Bouchard, Bar-Or, 2004). Horvat, Kalakain, Croce & Dahlstrom (2011) states that knowing that basic skills move to more complex movements (starting from the head to the feet and moving from the middle of the body to the outer limbs) and understanding how individuals move through the patterns of development, can help determine what one requires before moving onto the next movement. Programming for individuals with disabilities can be challenging, as age might not determine skill level but, rather, the ability to implement activities for movements that cater to the functional level of the individual. After this functional level, comes the progression to FMS where there is more active movement in the environment that is possible. FMS are vital in learning for these children; similar to children without disabilities they still help create specialized movements skills, which help in playing a variety of games and sports. To develop proper FMS in children with disabilities a general understanding of factors related to skill acquisition is important.

Horvat et al., (2011), report that in any child, there are six important areas for motor development: movement responses, gross to fine motor progression, central nervous system maturation cephalocaudal progression and action, proximal-distal progression and action, and possible impact of disability on the rate of the central nervous system (CNS) maturation. Some of the vital information to comprehend is that children

gain control through the larger muscle groups before the smaller ones, which means that gross motor skills should be developed first. In addition, maturation begins with the head and then moves towards the lower extremities. Therefore, they will typically develop motor skills in the upper body with accuracy before they acquire similar skills in the lower body. True understanding is acquired by applying this information by teaching children with autism yet there are two key challenges for physical educators. The first is trying to grasp how the child got to where they are today by understanding their prior experiences and biological attributes, while the other is designing and delivering an adequate program that can help the child reach their potential. What the child achieves in relation to FMS will be directly related to the quality and quantity of instruction (Horvat et al., 2011).

### **Autism and Motor Development**

In children with autism specifically, there is a lack of research that is related to motor development. There were assumptions made in earlier years that these children had no signs of abnormal motor development, possibly due to the look of grace and skill in movement repertoire but recent research has proven differently (DeMyer, Hingtgen & Jackson, 1981; Jones & Prior, 1985). Children with high functioning autism spectrum disorders were reported as having difficulties in completing motor tasks (Berkeley, Zittel, Pitney & Nichols, 2001). Due to the deficiency in the ability to complete motor tasks, approximately one third of children with autism are reported as being ‘clumsy’ therefore, consequently, struggle to perform organized movements. Further, no more than one motor task at a time as this population struggles with programming movement patterns

(Wing, 1969). Individuals with autism have been compared to other individuals with disabilities and have been inferior in regards to their ability related to motor tasks (Morin & Reid, 1995). The individuals with autism move at a slower and more controlled speed than individuals without autism. Their arm movements show unrelated actions (i.e. flapping arms), which in most ways is nonfunctional in a variety of activities, especially those that require targeting (Reid, Collier & Morin, 1983; Wing, 1976). Moving away from motor tasks such as arm movements and into motor patterns such as throwing or running (which are the basis of an individual's fundamental movement skills) individuals with autism are characterized as immature in relation to characteristics such as inappropriate arm movements. This is valuable information to understand, as the types of activities that would be created in movement settings need to reflect the specific individual's motor development. Knowing how far along in motor development each specific individual is will help to create the targeting activities and will allow for the opportunity to have a greater chance at reaching the objectives and improving upon their skill set.

Fundamental movement skills are essential to learn in order to have success in a variety of activities; the three categories are locomotion, stability, and object manipulation. Even though SFG require skills from each of the three categories, two main object manipulation skills are vital in creating success of throwing and striking actions. Malina et al. (2004), states that fundamental skills originate from basic motor skills that are typically developed in the able-bodied population by the age of six or seven. The basic movement patterns that are usually refined continuously through practice and instruction are then integrated into complex motor skills, which are the building blocks of

many game forms. These building blocks are what can be considered fundamental movement skills; something the majority of children have the potential to develop in life. Once these fundamental movement skills are learned, children can move into more specialized skills which are a critical part of a child's movement repertoire as they assist children in creating their environment. Emphasis is placed on movements as they form patterns through movement; however, many children can perform the basics but may have lower levels of proficiency.

### **Games**

To be able to create meaningful movement opportunities for individuals with autism while also working on the S-F skill set there needs to be an understanding of what games are. The objectives include two of the four games categories but concepts from all four can be transferred throughout that is why it is vital in understanding the broader concept before the specifics. The four games categories defined by Almond (1986) are invasion, net/wall, S-F, and target games. There are concepts within each of these games categories that transfer to the other three, creating a link to one another (Todorovich, Fox, Ryan & Todorovich, 2008). Mitchell et al. (2006) states that teaching the skills and tactics embedded in each game category is not the challenging aspect but rather, how to link the skills from one games category to the others. The first step is being able to understand which categories relate strongest to each other and then creating activities that can be transferable. Target and SFG are two categories that have skills and tactics that are transferable, creating the opportunity to use skills from one to transfer to the other. SFG are typically played with a ball where the objective is to strike the object so that it avoids

the individuals defending the designated playing area. On the other hand, target games are done by propelling an object with accuracy toward a target. By looking at the definitions there is a connection based on the skills of striking and throwing an object.

The overall aim of using games to teach is not just about learning motor skills through these games but also learning the tactics. Games allow for the opportunity to create the link between skills and tactics as this enables individuals to learn the game and improve upon their performance, tactics give the opportunity to apply the game-related motor skills (Mitchell et al., 2006). Bunker & Thorpe (1986) continue to state that the ability to understand the game increases the individual's likelihood to use the correct technique based on each unique situation. The use of tactics combined with skills allows the individuals participating to competently solve the problems that the games present. Horvat et al. (2011) states that these concepts are still needed for children with disabilities especially those with ASD. Individuals with ASD have a range of abilities related to motor skills; there is relatively limited research in regards to physical education programming for these children. Research does show that due to ASD being a spectrum, individual assessment is needed to determine strengths and weaknesses of each individual so that a proper physical education program can be created. Using hermeneutics as a theoretical framework will be useful in creating appropriate progressions of activities for individuals with ASD as it combines both the environment in which the activity was created in and interpreted (Patton, 2002). Hermeneutics allows for the interpretation and comprehension of the phenomenon at hand as it assists in constructing a reality based on what happened in the environment with the help of the participating individuals. The

overall concept of this framework is about understanding the world through a different lens and creating different reactions and scenarios (Patton, 2002).

**Striking-Fielding Games.** To create opportunities for individuals with autism in SFG there first needs to be an understanding of what these games entail in the able-bodied population. There is a similar concept in games requiring the skill of striking to those involving fielding as in both a batter tries to hit a ball and subsequently runs from object to object, while at the same time individuals in the field attempt to retrieve the ball to stop the batter from scoring (Todorovich et al., 2008). This seems like a simple task but, it can be broken down into various tactics that can be learned separately before bringing them together in game form. Even with it seeming like a simple task, SFG are used much less in the physical education curriculum than any of the other categories, especially invasion games (Butler, Sullivan, McGinley & Vranjes, 2007). Hooper and Bell (2002) believe there is two main rules that are required to be tactical principles that structure game play in this specific games category. The first of these tactical principles is being able to strike an object and then run between bases to score points. Conversely, the second principle is being able to stop the scoring or being able to get the batter “out” (Hopper & Bell, 2002).

S-F and target activities are played less frequently than both net/wall and invasion games within the physical education curriculum (Mitchell & Collier, 2009). Fiset and Mitchell (2010) report that net/wall and invasion games have more tactical complexity as they are faster paced; meaning individuals playing these games have to make decisions quicker. They add that compared to those two games categories, S-F and target activities

have less flow as they are slower paced so individuals have more time allowing for the chance to make fewer decisions. The tactical decisions or errors made are situation specific as each activity poses a variety of different issues. Todorovich et al. (2008) note that taking the tactical decisions and strategic aspects of the game and combining them with skill execution helps in learning the tactics of game play. Playing during practice also allows for game-like situations that let participants learn tactics that can be transferred into games (Lauder, 2001). These tactics that are learned cannot only be used in one game, but can transfer to various games within S-F as well as other games categories.

There are many activities that can be included in the S-F classification of games, some of which include softball, cricket, and tee-ball. Some of these traditional games in their true form are quite complex in nature, which is why being able to modify them has its advantages. When observing children at play in the outdoors, it is evident that they have some skills and tactics required for these games classifications, yet also noticeable is modified versions of SFG. At a park, there usually are not enough people to partake in a full game of softball so instead; children make modifications based on the number of people, equipment available, and their setting (Sinclair, 2004). There are various ways to modify SFG games where the outcome of learning is still able to develop the skills and tactics required in the formal game contexts. Some examples of modified SFG include over-the-line, batters choice, longball, argoball, or modified softball. Each of these is a fun game wherein students can be engaged while learning the tactical principles of the game (Curtner-Smith, 2003; Gorecki, 2004; Sinclair, 2004; Butler et al., 2007; Todorovich et al., 2008).

Modifications can be a better way to start teaching S-F as to not complicate the skills too quickly and not to confuse individuals. Students need to practice their offensive and defensive tactics in smaller groups and in a modified context that reproduces what a real game situation would be like (Turner, 2004). Students also need to experience both S-F in equal amounts so that all abilities have the opportunity to learn the skills and are provided many attempts to practice the tactical principles to become better players (Turner, 2004). By using modifications of the real game it allows for maximum opportunity for all individuals, along with helping to develop the tactical understanding and fundamental skills related to these games (Sinclair, 2004). Some of the most difficult parts about creating these modifications are matching skill and ability level of the students, allowing for maximum participation, and development of tactical awareness (Sinclair, 2004). The reason why modifications work so well is because, the traditional form of SFG have limited participation for everyone except for the elite players. These elite players overwhelm the less than elite which does not allow for a proper physical education class (Sinclair, 2004). However, by using some modifications, all students can benefit from the quality physical education as they will all be engaged and learning.

**Target Games.** There are a variety of modifications to S-F activities. At some point, the skills and tactics required to be practiced as target games can be used as a lead up activity in teaching the skills necessary for both the modified games and can assist in the skill development for the traditional game forms. The literature is going to help in getting a better understanding of what target games are and how they are used in the movement setting. This section will also cover how target games are specifically useful

for individuals with autism. Most importantly looking at how target games combine with SFG to teach the necessary skills and achieve the main objectives. Target activities are a useful lead up to a variety of games within the other three games categories as there is some sort of targeting needed throughout them to be successful. The objective of a target game is to send an object towards a stationary target (Griffin & Butler, 2005). It seems simple enough when it is defined in such a way, but target activities are overlooked in the movement setting because more popular games categories such as invasion games override them. Target games can be a useful way to assist in mastering the skills and tactics of a variety of games from a variety of games categories. Target games can be broken down into two categories: the unopposed and opposed, which can both be used to assist in improvement of skills and tactics (Mitchell, Olsin & Griffin, 2003). Unopposed classification means that individuals are still sharing space with their opposition, however, they perform independently, whereas opposed means that they can counteract a move their opponent has made (Sheppard, 2007). Some games that can be included in the unopposed category include golf or bowling, as each attempt is trying to get closer to the hole rather than block your opponent. Games such as shuffleboard or croquet would be considered opposed as you are waiting for the other team to make their move before making the next move; each attempt is calculated based on the attempt previously made.

The benefit of target activities, no matter which type, is that they require more preparation time in both the set up and pre shot than in any other games category. This allows for a longer period to accurately execute the skill (Fisette & Mitchell, 2010). For instance, in a game of golf, there is no one rushing a player into their swing, no rule requiring the individual to sprint to the ball and then hit it as fast as they can. In the other

games categories, the activities involved are typically at a much faster pace requiring individuals participating to make quick decisions and often causing them to feel rushed. In most target games there is time to think about the shot before it needs to be performed. In addition to longer preparation, target activities allow individuals to work on the fundamental skill of sending an object that includes aim, accuracy, and protecting a target (Wall & Murray, 1994).

Even though target activities are the least complex of all four games categories, teaching target games as a lead-up activity to other game categories such as S-F provides an opportunity to link the tactics and skills used in game situations while still allowing the individual to be successful (Mandigo, 2003; Sheppard, 2007). Target activities allow all individuals to continually be engaged no matter their skill level or ability because of the nature of decision making because even those students that take a longer time to learn they have time to think about the shot before it is performed. In invasion games, the decisions have to be made almost instantaneously during the game play, whereas target activities allow more time to prepare before making the decisions, thus allowing all students to make better overall decisions rather than feeling rushed. Further, target games allow a greater number of individuals the opportunity to be engaged, as they feel they can be successful (Fisette & Mitchell, 2010).

### **The Skill of Throwing**

Now that some of the literature has been covered on the topics of S-F and target games to further be able to achieve the objectives there needs to be an understanding of how the skill of throwing is broken down. To be able to improve upon the skill of

throwing within SFG the first concept that needs to be understood is what does a proper throw look like in an able-bodied individual and then focus on an individual with autism. The skill of throwing in typically developing children will progress from what can be called an 'immature pattern' to a 'mature pattern' (Malina et al., 2004). The fundamental skills of throwing can be observed as early as six months when an infant first starts to grasp and release. Once a child has developed some stability and locomotor movements, the throwing action will begin to progress. Each stage is attained progressively throughout a child's life, two years old is when an object is released and progresses to the age of six to seven, here a full mature pattern is developed (Horvat et al., 2011). There are four stages for the development sequence of the over arm throw, these stages are essential to understand in order to create a movement plan to improve this skill. The first involves leaving the feet in place with no trunk rotation where the arm and body movements go back and forth, in the second stage the feet continue to stay planted but the arm and body movements are now happening in the horizontal plane as a rotation component involving movement to the right in preparation to throw then to the left for delivery. The third stage involves a slight decrease in trunk rotation with an increase in hip flexion, as there is a forward step with the same leg as the arm that is throwing. The fourth and final stage involves the foot, which is opposite of the throwing arm, to move into the preparation stage by stepping forward, if the child is right-handed (opposite for left-handed) they will transfer weight from their right to left foot as the hips, trunk and the shoulders rotate to the left (Wild, 1938).

The skill of throwing does not change for individuals with autism, however, how they achieve each developmental stage and their age when reaching the mature pattern

may not compare to a typically developing child. The development of manipulative skills is encouraged to be taught during younger years to create more success in games situations later in life (Kovar et al., 2007). Manipulative skills specifically, are seen as a prerequisite for physical activity, games and sports. Horvat et al. (2011) describes how an individual with autism learns how to throw. The first throw is where it all starts and is typically done unintentionally. A child will have an object in their hand and then due to gravity that object will be placed at their side, they will then start swinging their arm back and forth involuntarily and then at some point the object will be released, usually accidentally, from their hand. This is then followed by one of three reactions, receiving praise, the object causes visual stimulation for the child as it soars through the air or the object makes a sound that catches the individual's attention when it falls to the ground. The stimulation is a vital part of learning how to throw as they receive an indication that something successful happened and are motivated to try again. Once the child has received their stimulation they then start to move towards their immature to mature pattern through three main types of throwing: underhand, overhand and sidearm (the first two being the key types). The underhand throw is the first of various throws to develop. The development of the underhand throw follows three main stages: first, only arm action (feet planted), following through with right foot as ball is tossed and then adding the forward step with the left foot. The overhand throw is developed afterward, is more versatile, and is comprised of four stages, which were created by Wild (1938). When teaching throwing it is recommended that learners throw for speed first, as accuracy and more body action will come as the throw matures (Haubenstricker & Seefeldt, 1986). The concept to keep in mind when working with individuals with autism is that they may

never reach a mature throwing pattern but there can be ways to try and create movement opportunities that can assist in creating optimal movement.

### **The Skill of Striking**

Striking is one of the skills that will be of focus in improving within the SFG. Similar to the skill of throwing to be able to create activities to help improve the skill their needs to first be an understanding of what the skill of striking is and how it can be deconstructed. Striking, also classified under manipulative skills, is quite different than the skill of throwing as it involves using an implement such as a racquet. This presents a greater challenge, striking with a racquet as it means that the hand is now extended and thus harder to control (Horvat et al., 2011). There are two types of strikes, the one hand strike and the two-hand strike. The one hand strike would be ideal to introduce first as it allows for the individual to choose their preferred hand; decreasing the hand/arm coordination (Cratty, 1986). Once the one arm hand strike is learned, a progression to the two-hand strike can then be made, as the two-handed strike requires the use of bilateral hand/arm coordination and the use of the non-dominant hand (Horvat et al., 2011).

Even though S-F activities rely on each other, performance success requires success at striking as well as fielding aspects, as the two require a different skill set along with tactical understanding. Striking, which usually includes batting, also includes three main concepts that need to be achieved in order to have success. For example, players need to score runs, hit the object so that it stays in play, and hit into open space. Conversely, fielding has opposite concepts as players want to try to stop the runner from scoring, get the batters out, and try to stop the batter from hitting into open space (Turner,

2005). These tactics are based around the player in the game context allowing the individuals to have the opportunity to create learning opportunities for others to gain these skills.

Hopper and Bell (2002) state that there are five additional ways to help increase an individual's cognition thereby helping the player to improve their tactical principles throughout the game. Allowing individuals to increase these tactical principles means that they have the tools to create opportunities not only for them to be successful but also for their team; this will create learning experiences and open up greater possibilities of winning games. The first tactical principle to help increase an individual's cognition is space, which is where a player should play the object and how that person moves in reaction to how the object is placed. The second is, knowing when the proper time is to execute certain skills within a game context. The third principle refers to the force in which an object is hit, which is impacted by the height, direction, or distance of travel. The last two tactical principles include self and others, both are similar in nature. The self refers to gaining tactical advantage over the opponent by using the components of space, time, and force. Other entails gaining a tactical advantage based on how your opponents are using the space, time and the force components. These components can be used as building blocks for creating appropriate modifications to SFG as teaching proper tactical principles and skills can be done using any modification and then be transferred to game contexts.

### **Understanding Tactical Awareness**

Mitchell et al. (2006) state that it is not just about teaching the skills that are required within each activity but about creating the link to tactics which will enable an individual to improve their performance. Understanding tactical awareness is a vital part of being able to have success within any game. The literature covered makes the connection between how to improve such skills as throwing or striking through tactics and also being able to teach the skills necessary for success. Tactics allow for the opportunity to apply the skills learned into the actual game performance. Having tactical awareness in a game is critical in executing the performance effectively as it allows for the ability to know and identify tactical problems that happen and respond to them. It is the ability to decide *what to do* during game situations, which is just as equally important in a game as the skill execution. French and Thomas (1987) believe that the mistakes that children make in sports comes from the lack of knowledge about the ‘what to do’ in a situation. Not only will tactical complexity help within each specific game but having the ability to understand what to do in certain situations can transfer from one games category to another (Mitchell et al., 2006). To become better in any game someone needs to have tactical awareness, this does not change for individuals with ASD. To better their ability they need to gain an understanding into the proper tactics and not just work on the skills. This area of research is limited in regards to ASD as the recent research has an emphasis just on the skill execution.

### **Teaching Styles**

Teaching students with disabilities, specifically those with autism is not effortless by any means but there are some teaching strategies and characteristics that can help

facilitate an environment that is as least restrictive as possible. The literature will outline some of the teaching skills that are used in the classroom and movement setting to teach individuals with disabilities. The literature will also show areas of teaching skills that may be limited and where teachers seem to have the greatest challenges in teaching these specific individuals. The lack from knowledge by teachers regarding how to create an inclusive environment is one of the top four areas needing improvement according to both students and parents (Pivik, McComas & LaFlamme, 2002). The roles of physical educators have shifted over the years. It is no longer just about the elite athletes or the students without disabilities, but rather providing meaningful physical education to students with and without disabilities (Block, 2007; Morin & Reid; Sherrill, 1998;). Meaningful physical education does not mean that students get “thrown into” whatever game the rest of the class is playing or by simply assuming the instruction is considered inclusive; but, by providing quality individualized instruction within all lessons and activities. Physical educators need to start planning activities that are developmentally appropriate movement concepts to address all the needs of the students participating (Block, 2007; Block & Burke, 1999).

There are two key challenges for movement instructors when teaching children with autism. The first is trying to grasp how the child got to where they are currently by understanding their prior experiences and biological attributes, while the other, is designing and delivering an adequate program that can help the child reach their potential. What the child achieves in relation to fundamental motor skills will be directly related to the quality and quantity of instruction (Horvat et al., 2011). High-functioning individuals with autism will have a greater opportunity to be integrated both within the

school and community, compared to lower-functioning individuals based on the level of disability (Eaves & Ho, 1996). Understanding whom the child is and what unique patterns of behavior they have will assist in planning developmentally appropriate lessons.

Due to the use of restricted, repetitive and stereotyped behaviours as well as having both social and communication issues, integrating children with autism into the classroom is a challenge (Pan et al., 2011). Besides the stereotyped behaviour, there is also a variety of other weakness that individuals with autism have that cause them to struggle with fundamental movement skills that other typically developing children would not struggle with. Social areas that create difficulty in the physical education classroom include: not being able to understand social cues, lack of eye contact, trouble sharing with other individuals or inability to make friends. Physical activity and motor skill complications include such areas as locomotor skills, object manipulation and control, as well as movement execution and planning (Pan et al., 2011). With the unique characteristics that accompany autism, these students may not be as active as the characteristics may interfere with traditional forms of physical activity. If physical educators have the knowledge to pre-plan developmentally appropriate movement activities, the skills that are required in the traditional forms of games could be taught through modifications (Sandt & Frey, 2005). As educators, understanding what the whole child needs is critical as all characteristics will affect how the children are affected in physical education. Knowing both the social and communication needs of these children will assist in creating a supportive learning environment that gives the children a chance

to develop gross motor skills and other fundamental movement skills (Berkeley et al., 2001).

As previously stated, in the physical activity setting, individuals with autism have weaknesses in relation to fine and gross motor development (Emck, Bosscher, Beek & Doreleijers, 2009). Knowing that children with autism have a variety of unique characteristics that they carry with them into the classroom may as a teacher or an individual working with this population make the teacher apprehensive, creating a stressful environment for all individuals within it. Combining these attributes within the context of a lesson, with the other students in the class can make implementation of effective instruction challenging (Crollick, Mancil & Stopka, 2006; Reid & O'Connor, 2003; Zimbelman, Paschal, Hawley, Molgaard & St. Romain, 2007). In order to alleviate some of the issues related to implementation, creating a more individualized approach based around both assessment and intervention is helpful (Howlin, Magiata & Charman, 2009). Physical education has focused on effective instruction and interventions recently within a wide range of individuals, which may help with assisting in alleviating issues around implementation. More importantly, knowing educators' attitudes towards this specific population is an important aspect of creating a successful program for these individuals (Rizzo & Kirkendall, 1995). An educator who has a positive attitude will learn to understand the child's experiences and will eventually learn how to read a child's feelings or thoughts from their body language and expression in class (Goodwin, 2001). This will not only give an advantage to the individuals with disabilities but to all students as the educator will be able to make appropriate decisions based on what they see, making simplifications or extensions as necessary.

Individuals working with the special needs population (specifically those working with individuals who have ASD) should know how to take a skill and break it into smaller pieces as the initial skill may be too challenging to begin with. Also, being able to add new information once the student has mastered the skill being taught (such as being able to teach the initial part of the arm swing in a throw and then as it is mastered continue on from there) is a characteristic needed as an educator (Rouse, 2009). To make all the tasks work, the child's space, time, and events should be organized and structured in a way that allows for optimal learning (Houston-Wilson & Lieberman, 2003). First and foremost, having a set routine is imperative as this allows the environment to be predictable and the routine has both a beginning and an ending (Ford, Riggs, Nissenbaum, & LaRaia, 1994; Geckler, Libby, Graff, & Ahearn, 2000; Houston-Wilson & Lieberman, 2003). In addition to having a beginning and ending, there needs to be a reason known and explained why children are doing the activity. This is why physical education has to include meaningful movement. If it has no meaning there is no point in learning the skill. To help with the activities an instructor can use visual or verbal responses as well as the sequencing of telling, showing, and doing the activities to assist in their response to the activity (Rouse, 2009; Houston-Wilson & Lieberman, 2003). When working with individuals with ASD it is important to make every aspect as predictable as possible, by taking advantage of the resources that are around, especially support personnel that work with these individuals outside the physical activity setting as they might have tips that can be used in the physical setting (Kamps, Dugan & Potucek, 1999; Mangus, Henderson & French, 1986; Houston-Wilson & Lieberman, 2003). The unique behaviours of individuals with ASD present significant challenges in a classroom,

but if schedules are given and visual and verbal cues are used it can create an environment where they feel comfortable and can improve upon their movement repertoire (Schultheis et al., 2000).

Mitchell et al. (2006) states that there is research lacking in the area of creating transfer to the understanding of physical activity, which is surprising to researchers as there is literature on the transfer in other educational areas. In the research, there is evidence of the transfer of learning strategies from reading into areas such as writing and even geography (Benson 1997; McAloon, 1994). It is hard to understand why studies are lacking in the area of how knowledge and tactical understanding transfer to performance of one game to another (Mitchell et al., 2006). Further, trying to understand the connection to disability, there is evidence to sustain some of the key points between the relationship between target and SFG in individuals with ASD. More research is still needed to get an enhanced understanding into the skill of throwing and striking, the tactics and teaching techniques behind how to better teach SFG to individuals with ASD. For this reason, the aim of this study is to increase understanding about the potential benefits of combining target activities with SFG for individuals between the ages of 12 to 16 with high functioning autism spectrum disorder. Specific objectives are to assist in improving the skills of striking and throwing in SFG, aid the learning of tactics (hitting into open space and knowing when to run) that are also useful in performing SFG, and to add to current understanding about how the design of an instructional station might be linked to such skill and tactical transfer in individuals with ASD.

### **Chapter III: METHODOLOGY**

#### **Overview**

A qualitative research process was chosen to gain an understanding as well as, describe and explore the relationship between target and SFG in individuals with ASD. Qualitative research takes readers into the time and place of the event to gain insight into what is happening as if they were involved in the event. It shows readers ways in which someone else views his or her world around them (Patton, 2002). The interest of qualitative researcher's is focused on how people construct their environment around them, as researchers wanting to understand how someone interprets and makes sense of the world that surrounds them (Merriam, 1988). As a researcher the ultimate goal was to better understand the relationship between the two game forms in order to create a way to help improve various skills for individuals with ASD through their environment. To gain a better exploring how they viewed the world around them and then through this creating activities based around their reactions and the observations to the surroundings. Appendix A allows for the understanding into who the individuals were that were apart of the study and their overall roles in regards to the research study, allowing for a better understanding throughout the methodology and results chapters. Appendix B adds further understanding into the next two chapters as it gives an overview of the layers of the data and data analysis.

Qualitative methods typically are collected through three types of data: interviews, direct observations, and written documents. The data collected comes from the fieldwork this is where, as a researcher firsthand notes were made through the lens of the individuals participating in the event. This allowed for direct contact with the

individuals in the study, usually in their own environment, which can be beneficial for an in-depth understanding of their world and realities. The strength of qualitative data depends on the researcher due to the fact that the participant's sensitivity, integrity and methodological skill will determine the quality of the data collected (Patton, 2002).

**Theoretical Framework.** Hermeneutics is a form of qualitative inquiry that is different from any other as it uncovers how something is interpreted and depends not only on the cultural context that it was created in but also, the cultural context that it is interpreted in (Patton, 2002). How this is separated from other forms of inquiry is that it creates a theoretical framework for an interpretive understanding but with a focus on both the context and purpose at hand, the main concept is to both interpret and understand a phenomenon (Patton, 2002). Willis (2007) states that there are two common characteristics of hermeneutics; the emphasis placed on the importance of understanding language and the emphasis on context, as a framework. It is used to establish an understanding of what people do by constructing a reality based on the interpretations of the data by the researcher, with the help of the participants in the study (Patton, 2002). To fully understand this form of inquiry, as a researcher having the ability to identify interpretations from a different lens did add dynamic, as each person would interpret a situation differently based on their reactions, creating different scenarios or focusing on different aspects of a setting (Patton, 2002). Kvale (1987) makes a valid point by stating

“The interpretation of meaning is characterized by a *hermeneutical circle*, or spiral. The understanding of a text takes place through a process where the meaning of the separate parts is determined by the global meaning of

text. In principle, such a hermeneutical explication of the text is an infinite process while it ends in practice when a sensible meaning, a coherent understanding, free of inner contradictions has been reached” (pp. 62).

This specific research study fits in with the chosen qualitative inquiry as it was about the researchers understanding and interpretation of a specific community in their own environment. It allows for a rich description of the human action of individuals with ASD within the physical activity context. It is not just about looking at the outside layer where the larger themes occur, but rather, getting deeper into the understanding of their world and finding themes within the core of the study. The study strived to understand the benefits of combining target and SFG, through actions and interpretations, both visually and verbally. Being able to gain a deeper understanding of how a community of individuals embraced the context around them, through a different lens, that is able to describe the cultural context. The research looked through the lens of a comparative case study, using observations, field notes, interviews and analyzing documents.

**Case Study.** Case studies are qualitative in nature, exploring a bounded system or multiple-bounded systems over time. Merriam (1988), states that to create a case a researcher has to look at a phenomenon, this may be a program, a community or a specific group of people. A case is described through multiple sources of information that are both detailed and in-depth as to assist in helping to report a case description and discover the main themes. Case studies are distinguished by the size of the bounded case; cases can be about one individual, a group or an entire program (Cresswell, 2007). For

this research study the case included six individuals with high-functioning ASD. Stake (1995) states that a case study is meant to understand the complexity of a single case that is being studied because it is of special interest. Through the complexity of a single case coming to understand the specific activity engraved within the circumstances. Within a single case can be multiple bounded activities that help to elaborate on the larger issues. Through fieldwork, the researcher engages in a multitude of case studies or layers that may create overlapping themes therefore, the final case takes time and consideration (Patton, 2002). The main goal however, is to reconstruct and analyze a case from the theoretical framework of hermeneutics (Hamel, Dufour & Fortin, 1993). The goal is to understand how these individuals with ASD learn the skills required for SFG through their own perspective; this is done through focusing on the six individuals (single cases) as bounded cases.

A case study allowed the ability to use an authentic setting to gather rich, detailed description; it helped to better understand the lived experiences in the social context and can be done without a predetermined set of goals (Merriam, 2007). Most importantly, case studies are unique in data collection, organization and analysis, creating an analysis process. Through the rich description that is comprehensive, systematic and in-depth the analysis process results in a *product*, also known as a case study. Meaning, a case study can be one of three things; a process of analysis, a product of analysis, or both (Patton, 2002). In creating a comparative case study the first phase is to use a *within case, within cohort analysis*, which is a detailed description of the themes within one specific case from an inductive approach. For this specific study the first phase focuses on an analysis within each participant (individual with ASD) and then within each worldview (student-

instructors and researchers). Next, phase two requires a thematic analysis, *across-case analysis but still within the cohorts*, this also includes an interpretation of the overall case. To better understand phase two in regards to the study it means an analysis across all six individuals with ASD but still within the two worldviews (researchers and participants). Lastly, the third phase involves *across case across cohort analysis*, which is an interpretation across all six individuals, across all the forms of data (researchers and student-instructors) through a deductive approach. The last phase involves the reporting of the meaning of each case or what can also be described as the ‘lessons learned’ (Lincoln & Guba, 1985). Having six participants brought a variety of observations, using an across case analysis allowed the researcher to see similarities and differences within the specific activities chosen. This was used to understand how each individual interpreted the activity at hand and what can be done to assist the community as a whole to learn the skills at hand. When data was collected the observations were compared across the cases to see if there were any similar observations that may be essential in mentioning in the results section. After making comparisons it is important to know that the statements are interpretations and a hypothesis from the researcher’s standpoint. If someone were in the field for an extended period of time they would be able to give insight into why certain occurrences are happening. Understanding how the phenomenon took place and how it created the specific results was possible as the researcher had only been in the field for a diminutive period of time (Patton, 2002).

In this research, a comparative case study was chosen to examine individuals with ASD participating in target and SFG. Through the use of a comparative case study the concept was to describe in rich thick description the experiences of six specific

individuals, through this being able to explore their experiences in the environment in order to get a better understanding of how target and SFG can relate to one another. A multi-case design was chosen where each individual was a single case within a larger case (community of autism). Each single case was analyzed through interviews, observations, field notes and document analysis and then was involved in a cross-case analysis thus creating a complex system.

**Participants and Setting.** The Saturday Special Needs Activity Program (SNAP) is a developmentally appropriate movement education program at a university in South Western Ontario that is offered to children in their teenage years that have been diagnosed with ASD. The first year of Saturday SNAP was in 2011 when 16 students, enrolled in a Physical Education and Kinesiology course decided to pilot the program. In its first year of operation, the program typically had between five to seven participants attending on a weekly basis from 2:00 - 4:30 p.m. using both a gym and the university pool. A typical day starts off with about 45 minutes of time spent swimming (usually including time to change) and then progresses to the gymnasium which is set up into various stations at which participants work on fitness and fine and gross motor movements. On a typical day the set up would include a scooter area, the Canadian Climber, a shapes section with trampolines, spring boards, a targeting area (including the badminton nets and a fitness station equipped with medicine balls), thera-bands, and various ropes. Each station is built around pedagogical concepts that allow for appropriate and meaningful movement to help increase repertoire of skills.

The senior undergraduate students running the program were not only responsible for setting up the stations each week but also creating a weekly program for their participant. These programs were based on observing the participant's strengths and weaknesses during the first week. To assist in the creation of program plans, students would meet on a regular basis each week to talk about areas that could be strengthened and go over them with the supervising professor. Based on the set up, there was not a designated plan for the order in which we engaged in each station. This meant that the students could rotate throughout the various stations in any particular order they wanted and could spend as much or as little time as they felt necessary. In the second year of the program, the goals were ultimately the same as the first year; however, the program was altered somewhat by adding a couple of stations such as a balloon station at fitness and some midline crossing stations. In the third year of the program, as a researcher improvement upon the targeting station became necessary in order to help the participants work on various skills that could be transferred to SFG while also implementing appropriate pedagogy.

### **General Procedures**

The following section focuses on the data collection procedures that were used throughout the research study including: case selection, gaining entry and consent, data collection methods, leaving the field, data analysis, and trustworthiness. Due to the nature of the population chosen, choosing a site to conduct the research was relatively limited. As a volunteer with SNAP for the past four years and recently working with Saturday SNAP, this experience should be shared as it is one of the only programs in the area that

is provided for teenagers with ASD. Since the Saturday program is relatively new and still developing in regards to the activities within it, being able to implement various forms of games related to S-F was possible compared to other established programs whose activities are already developed.

**Case Selection.** There were eight participants with high functioning autism invited to be a part of the research study, only six ended up being able to attend the program. These participants were chosen based on their availability and the nature of the research questions. Purposeful sampling was the type of approach chosen that was used to gather participants. The concept of purposeful sampling lies in the ability to select *information-rich* cases to be studied in depth. These types of cases allow for a great deal of learning in regards to the main issues that relate to the purpose of inquiry (Patton, 2002). This type of sampling is meant to illuminate the questions in the study. Through the use of information-rich cases instead of creating generalizations in the research that a variety of other sampling forms would create instead, purposeful sampling allows for insights and an in-depth understanding of the phenomenon under scrutiny. It is choosing the participants that can be difficult but after a few visits to the site it was evident to the researcher who to sample for the study (Schatzman & Strauss, 1973). These particular people were based on the purpose of the study and categories such as age, gender and functional level served as starting points in choosing the participants (Coyne, 1996). The overall goal was to select participants that fit the needs of the study but to also include a wide range of variations within that specific phenomenon to allow for the information-rich cases (Morse, 1991; Patton, 2002).

For this specific research study the participants were chosen from an array of profiles that have been created through autism camp and the Saturday program. Both programs run through a professor in the Kinesiology department. Some of the individuals that were involved have also been a part of the Saturday program for the last two years. This helps as those individuals are familiar and not as anxious the first few weeks due to already knowing how the program runs, which is important with this population. The other students that were invited were invited were from autism camp, meaning that they have not only been to Brock University before but also have done activities in the gym. The number of emails sent out to parents to invite them to be apart of the Saturday program was determined by the number of students wanting to be involved for that particular year. Once the emails were sent out the parents then replied if they were interested in the Saturday SNAP program and signing their child up for that year. Once the parents had confirmed those profiles were then taken and look at to determine who was high functioning and who was low functioning as only the individuals with high functioning autism (HFA) could partake in the study. The major determining factors for being high functioning was the participants ability to be at a level in which they could physically partake in SFG as well as both receive and respond to instruction and the ability to understand visual and verbal techniques.

**Gaining Entry and Consent.** As Patton (2002) states there are three main stages in fieldwork. The first is gaining entry into the field and involves getting authorization from the gatekeeper or the person in charge to do the research and then getting into the actual environment of the study to begin research. There are a few obstacles that need to be overcome before actually getting the opportunity to be in the environment to do the

research. The study was approved through Brock Research Ethics and then from the parents. A consent form (see Appendix C) was given to each parent individually and the study was discussed at that time, before signing. The discussion included an overview of what the research study entailed as well as how their children were going to be involved (this is a time where any questions and/or concerns were addressed). In addition to getting consent forms from the parents there were also consent forms given to the university students who were working with the participants (see Appendix D). Instead of holding separate information sessions, during the first meeting for the planning of Saturday SNAP, information was given in regards to the proposed research study. The university students (student-instructors) then had the opportunity to work one-on-one with the participants (each individual with ASD) involved in the study. The students were not forced to work with the participants as it was their choice, they had time to consider giving their consent to partake in the study and did not have to decide right on the spot. The explanation of the study was given at the first meeting for Saturday SNAP so that the students were informed of what being apart of the study would involve. They each knew the participants that were going to be asked to take part in the study and knew that they wanted to work with that specific individual they would be in the study. If they decided not to be a part of the study there were other individuals in the program that were not part of the study with whom they worked with instead. If they needed time to decide they were asked to know by the meeting the following week so that the researcher knew who was involved in the study and could get consent before data was to be collected. Lastly, written permission from the conveyor of the Saturday SNAP program was gathered to allow the research to take place in that specific environment.

## **Data Collection**

To collect data, multiple methods were chosen to create rich-thick description. The data collection process includes ethics approval, interviews with the students working one-on-one with the participants, observations, field notes, and document analysis.

**Interviews.** Interviews were used as a way to engage with the student-instructors about questions related to the area of research study (DeMarrais, 2004). They are interpersonal and are typically a conversation between two people where the theme is of some importance to both (Kvale & Brinkmann, 2009). Researchers cannot observe everything that goes on; therefore understanding feelings, thoughts or previous behavior only help to enhance the rich description. The interview allowed for those thoughts to come out as it permitted the students to reflect on their own experiences. This created for a deeper understanding into what was happening in their environment, as they were the ones that got to connect with the participants that were involved in the study over the semester. The students have a better idea of the unique characteristics of the participants with whom they were working, a connection that the researcher was not be able to understand without an interview. The interviews also allowed the opportunity to determine if there was a connection between the observations and field notes that were collected by the researcher to the insights that the interviewers had, allowing for significant events to emerge.

Interviews were conducted at the university no later than one week after the last session. The time of the interviews was dependent on the students' schedules and the location was booked through the Kinesiology department, the room depended on the

availability. The location was somewhere quiet enough to be able to code the data yet the students did not feel like they are secluded with just the researcher. When using the room for the interviews the door stayed partially open at all times so that the student did not feel pressured.

Before each interview students were given an explanation of the process for the interview and what was going to happen to the data once collected. The students were then asked if they would like to further continue with the interview. After receiving the verbal permission (signed consent forms at the beginning of the semester) from each student, the interview was then taped and recorded, followed immediately by transcription by the researcher, directly (Appendix H). Once the interviews are transcribed, verbatim, they were then sent to each student. The students were given the opportunity to look over their interviews had they wish to add something they thought about later, or in case they needed to alter something they might have said and did not feel comfortable with anymore.

**Observations.** The researcher talked with the parents prior to the first session of observation to outline the research and objectives that would like to be achieved and get their consent. Once the consent was given the observations then began. Observations were done through the use of semi-structured observations, meaning that the researcher took field notes under headings (e.g., interactions while arriving, striking, shuffleboard) that were created prior to the first week but altered after engaging in the initial week of observation and due to changing lesson plans, routinely changed. Semi-structured observations allow for the necessary freedom needed within the specific phenomenon

while creating guidelines to follow. These guidelines allowed consistency across all participants as well as put thoughts into categories while observing the day-to-day activities. While observing the environment some of the topics that were included were the physical setting, participant's activities and interactions with others and the equipment around them, non-verbal communication (symbolic movements or hand gestures), my reactions to certain situations, and the reactions and behaviors of the individuals working one-on-one with the participants.

Being a volunteer with the disability programs (Thursday, Saturday and Summer SNAP) at the University for four years had allowed the participants to become familiar with the researcher; therefore, being in their environment should not fluctuate or create inconveniences and should go almost unnoticed. If the researcher was new to the participants they might act differently or not focus on the skills at hand but rather just focus on the new person as for individuals with ASD having new people can disrupt their stable environment. As observation will be the major means of collecting data through this specific study, understanding what type of role a researcher can take is vital. Participant as observer is the stance chosen for the reason that it allows for a more active role in which the researcher can get involved in the central activities (Gold, 1958). This allowed the researcher to take on some of the responsibilities and be embedded in each participant's goals and objectives without fully committing (Adler & Adler, 1998). As University students were working one-on-one with the participants they needed the ability to become engaged with and to assist in the running of the target activities.

Observations happened once a week at Saturday SNAP, lasting for approximately one and a half to two hours each week. The observations were only during the time the participants were in the gym and using the equipment that was provided for them. These observations did not just include the target station but also the fitness, scooter and gladiator stations because once the participants started to learn the skills being taught at the target station they then started to transfer skills to various activities outside of the target station. The majority of the observations will occur as each participant is engaged in the targeting station at which they will be participating in activities that will be designed to help increase their skill repertoire. Observation will also be taken of the teaching styles implemented by the students and the reactions to the various forms. There will be no observations made by the researcher of the work that the students were doing since the only part that will be looked at is the teaching styles (which will be given them in the meeting previous to each session) especially on the participants' reaction to the instructions given. The focus in regards to the student-instructors is looking at how their teaching affects the participants not how well they taught the lessons.

**Field Notes.** Field notes were also used as a means of data analysis, when done correctly they allowed not only the reader but the researcher to experience what happened that day through their report (Patton, 2002). Field notes were taken during the session as observations were made about what was happening in the environment. Notes were also taken right after each session had ended as there were times that observations were happening creating no time to write down notes at the same time. The main point about field notes is that they are descriptive therefore; during analysis the researcher should feel as if they were returning to the observations that were made during each session. Patton

(2002) states that field notes should be written in such a manner that a reader should feel as if they were able to experience the same activities as were happening at that specific moment. As a researcher having to develop the ability to not only be descriptive but also concrete and detailed throughout the written notes; it is not about the researcher's interpretations but about what is actually happening in the environment (Patton, 2002). Each week the field notes had a list of the participants present, they described what was meaningful about them and had diagrams of the physical setting; where everything and everyone was situated, allowing for a better understanding when trying to make inferences in the *future analysis*. Notes were highly descriptive, following the theoretical framework of hermeneutics, describing: participants, the setting, activities and reactions to the activities and the reactions to strategies the students use. The field notes also gave the researcher a chance to express their own feelings, the aspects that were going well and the others that were not. The researcher's part talked about the meaning and significance to them about what was happening, these notes were written the same day as the observations were made as it is not something that could be reflected on later (Patton, 2002). Overall, as a researcher in the environment knowing that there was going to be occurrences that happened each week that were unexpected, whether good or bad, being able to write them somewhere only enhanced the data analysis.

Merriam (2009) states that in addition to the description given each week, formatting the field notes in a way that allow them to be readily available for the reader to find the desired information is important. When the field notes were written a wide margin was left on one of the sides of the paper to allow room for additional thoughts later on, as well as leaving a double space between activity segments so that reading and

data analysis could be done with ease. In the margins on the side it was important to be reflexive. By being reflexive it will include personal feelings, reactions, hunches, initial interpretations of events and speculations of what happened in the environment (Merriam, 2009). These are above and beyond the initial observations it did include comments and thoughts related to the setting, people and activities. The field notes were a key aspect to the data collection process and allowed the end results to have a more 'rich description'. Being allowed to leave an environment and come back to the observations in an hour or so after the actual event lead to remembering content that may have been overlooked earlier. Field notes were an ongoing data analysis but were a vital part of case studies as they are considered the fundamental aspect not only in case studies but also in the *cross-case* analysis (Patton, 2002).

In addition to written notes, observations and written notes were kept based on the throwing, striking and tactics chart (See Appendix E, F and G). These charts had two columns: one had a rating scale from one to five and the other was used for reflective notes based on each section. The skills were broken down into multiple stages and then a score from one (low) to five (high) was given based on the ability to do each of the specific skills successfully. The overall reason behind using the charts was to see if there was a change in any part of the proposed areas that were of focus by comparing the initial observations to the final observations. Also, the charts were used to help provide a framework for creating the target activities as it showed the weaknesses of the participants. They also showed areas that were improving or decreasing on a weekly basis therefore, the activities were then altered to try and accomplish the proposed goals. The charts were used for the research only as it allowed them to be able to create better

overall lesson plans that progressed according to what was being observed, only observations were analyzed not the charts. The charts were not analyzed because they were made up of the observations to be able to see where the skill weaknesses were.

### **Data Analysis**

A challenging aspect of qualitative analysis is that there are large amounts of data that the researcher has to interpret and determine as significant by reducing anything that seems trivial. Once done, patterns in the data were determined using a created framework for identifying what the data had to tell (Patton, 2002). The first step involved understanding what the field notes showed and trying to find the significant event(s) within the notes. Through the various forms of data collection trying to determine what was important to note in the final results. As some of the field notes were written throughout the program on Saturday, after the program those field notes were then typed and other reflections and interpretations were then added. By typing the field notes, it allowed the researcher to immerse themselves into the events that occurred that day allowing for a better feel of the culminated data as a whole (Patton, 2002). The field notes were first analyzed individually based on each specific form of data collection in regards to each participant, followed by an analysis done across all the forms of data and then finally the data was cross-examined between all participants. For the first analysis, the observations were highlighted based on themes and significant patterns. A variety of different colors were used based on the themes that were noticed, this allowed the final analysis to be more organized therefore, easier. The data was highlighted with each research question being a different colour; there were times where some words or

sentences were highlighted with more than one colour if they seemed to be a part of a variety of research question. Besides analyzing the skills and tactics the research looked to see if some of the target activities worked better than others to teach the various forms of skills and tactics. Once everything was highlighted it was put into chart form in regards to each specific question. Each question was then analyzed in regards to each participant and each form of data collection, separately. This was done to see the themes and significant patterns that were beginning to arise in the data in each specific form of collection. Once this was done a cross case analysis was the next phase where the research compared the themes and patterns across all the six individuals to see what similarities and differences occurred. In phase three these findings were then cross-examined with all the forms of data (researchers and student-instructors) to see if there were any similarities or differences as they created significant events, especially if certain types of target activities were improving skills and tactics for all participants. Cross-examination is a valuable way to enhance data as gives a way to triangulate information that is gathered through all participants to see both the similarities and differences (Adler & Adler, 1994).

The students' weekly journals were analyzed and compared to the field notes, in phase three to see if both were noticing similar patterns. The researcher looked to see if based on their connection with the participants they had noticed significant events that either the researcher also noticed or did not get to notice based on their role. This played an important role especially when both the researcher and the student-instructor were noticing similar events. Lastly, the interviews were then transcribed verbatim and sent to the student-instructors to review it for accuracy and they had the opportunity to both add

information that they may have remembered or remove information. Once the interviews were sent back they were all read and the same process as the field notes was used; reading, re-reading and highlighting. The codes were determined based on the analysis from the field notes, trying to see if there were similar events occurring between the field notes, journals and interviews which could lead to significant data.

### **Lesson Plans for Each Participant**

The researcher on a weekly basis created the lesson plans; the first week was the same lesson plan for all six participants to be able to determine their baselines. Once their baselines were determined the lesson plans were individualized and progressive based on the participants strengths and weaknesses observed in week one. The lesson plans were creative in that they included various pieces of equipment such as: hula-hoops, Frisbees, cones and shapes. The student-instructors on a weekly basis delivered the lesson plans to the participants; on the lessons was the way in which to give both visual and verbal instructions and then modifications in case the activity was too hard or too easy.

Appendix I is a chart created for two reasons, the first of which was to show the general baseline of each participant. The chart shows the progression from where the participants started and eventually finished by looking at the areas that were of focus in regards to the participant's lessons. The lesson plans for week two show the areas that needed to be of focus after observations were made in the first week of data collection. The other reason for creating this chart was to show that not every participant had the same activities throughout the weeks they were at the program. There was significant overlap in regards to the lessons, as participants did struggle with similar skills, not necessarily the same

week. Appendix I depicts the lessons that each participant received before data analysis this aids one in understanding some of the overall themes and patterns that arose in the results chapter. It also gives an idea into which weeks each participant was present and the skills that they might have missed due to not attending. Overall, Appendix I is needed to be able to understand the data analysis that was done in the results section.

### **Trustworthiness**

To increase trustworthiness within the research, triangulation was used to assist with the design. Patton (2002) states that by using various forms of data this is called data triangulation. Hence, various forms of data collection, document analysis, and interviews were used allowing for less vulnerability to errors compared to using one form or method. In regards to this study field notes, observations and interviews were used to enhance trustworthiness. All the forms of data were used to give different perspectives to make sure that the results found were not just from one individuals or one perspective. This also helped to eliminate bias, as it was not just the researchers perspective. Even though through different types of data there may be some inconsistencies, this allowed the research to increase in strength as it allowed for deeper insight into the connection between the purpose and the phenomenon of study (Patton, 2002). To increase credibility within the study the interviews and document analysis were used to add another perspective rather than just having it come from the researcher's perspective. The students were the ones that were working each week with the participants and had developed a stronger rapport than the researcher was able to create therefore they knew the participants better. Including the interviews allowed for as close to a perspective from

the participants as possible. The students were also being included in the research not only due to their connection with the participants but because they were putting in time on a weekly basis to meet, plan and attend to help the participants improve upon their movement repertoire and create meaningful movement opportunities. The use of the student-instructors journals and interviews added a different dynamic to the researchers observations, it was also a way in which to make sure that multi perspectives were given to make the results more credible.

Triangulation is a way in which to lower the bias that is created through research but using data from humans will not create an absolute truth. As a researcher the goal is to try and stay as neutral to the situation as possible but that is not easily achievable (Patton, 2002). A researcher will bring their own interpretations and biases to the study no matter the methods used as it is just a part of who they are, it is about how they interpret the world around them (Denzin, 1989b). In this study the researcher was not able to remain absolutely unbiased to the situation but through the use of writing reflexive journals after each week it assisted in lowering the bias. The other form of bias could have been the student-instructors trying to reach the goals that the researcher had set out. The participants themselves were a way in which to lower this bias as well as others, due to the fact that the participants are unpredictable. Even if the student-instructors wanted the lessons to go exactly as planned to try and impress the researcher the participants always add something to the situation that makes doing a lesson plan perfectly, near impossible. Added to all of this was the use of a trained coder that was a part of the Saturday SNAP program that understood the students and the participants and that was the professor from the Kinesiology department in charge of the program. The

professor was used as a confirmation of the coding practices that was done after the data had been coded. It was done after being coded so that the professor could not see any of the names of the participants are the student-instructors results as to not have bias. The trained coder (professor related to the Saturday program) reviewed the process of coding to make sure that it was correct and that the researcher was not missing important themes or significant patterns that might only be evident to a trained professional.

### **The Researcher's Role in the Daily Structure**

Understanding the role in regards to how the researcher assisted in structuring the program is crucial. The plan was to be involved with the recruitment process of the Saturday program, as it cannot run without students. Also, to be involved with helping to run the weekly meetings as this is used to discuss the structure and planning of the program. As a researcher being able to help with ideas for setting up the main stations was discussed at the meetings, except for the target station as this was the main responsibility for the researcher on a weekly basis. The program was based around student's commitment before inviting the participants therefore, the number of participants fluctuated; however, the goal was to recruit 10-15 participants. Of those 10-15 hopeful individuals, eight were invited to partake in the research study, six accepted. The researcher was in charge of creating the targeting station routine for those participating in the study on a weekly basis. This means that being closely involved with the student-instructors who were working one-on-one with the participants was necessary as they were still responsible for creating the plans for the other stations (pool, gladiator, scooters and fitness). The reason they were creating the other stations is that some of the

students were partaking in Saturday SNAP as a credit within the department and this is where a large majority of their mark was designated.

During the first week of Saturday SNAP observations and field notes were taken on the strengths and weakness of the participants in the modified SFG that were set up by the researcher. Once these notes were analyzed for baseline indications of the participants, weekly schedules were then created based on these results. The lessons focused on the participants weaknesses and as they improved other areas were then of focus. The second week included a variety of target activities, specific for each person, which assisted in developing the weakness in regards to throwing, striking and other tactics. There was specific games set up for each individual as their baselines differed, on top of that, as the weeks continue the target games were adjusted based on the progress in the participants abilities. The target activities allowed them to manipulate objects using various forms of equipment such as: various sized racquets, beanbags, tennis balls, tjouckball nets, curling stones and many other pieces of equipment (all available through the equipment dispersal agency at the university). During the last session, the participants took part in a modified SFG similar to the initial week, to observe if there were changes in their throwing, striking, or tactical awareness skills. Throughout the weeks of observations notes were taken on the teaching techniques that were used and how they affected the participants. Such forms of teaching techniques included the use of visual and verbal cues, prompting and use of equipment, just to name a few. This allowed for a better understanding into how to use teaching technique to allow for the skills to be performed in the most effective manner possible.

## Chapter IV: FINDINGS

This chapter will be organized by three phases that were used to help in analyzing the data that was collected through the methods stated in the methodology chapter. This chapter will start by introducing *Phase 1* which was an analysis of the content within each case and within each cohort, meaning within each of the six individuals and within the researcher and student-instructors world view. Looking at the field notes, observations, student-instructors' journals and the interviews to discover key words and revelatory phrases completed this phase. *Phase 2* consisted of a cross case analysis but still within cohort (across all six participants but still within the two world views), which involved taking the key words and revelatory phrases found in phase 1 and looking across each individual participant to note any similarities or differences. The last part of the analysis phase (*Phase 3*) was the across case and across cohort analysis (across all six participants across all the forms of data collected) focusing on patterns that were reoccurring between all participants, which was done through a deductive analysis. To be able to understand the results in this chapter, a summary of the overall purpose of the study will help to improve the understanding. The aim of the study was to understand if target activities could be used to help in improving striking in SFG. The target games were designed specifically for each participant based on their strengths and weaknesses that were evident through weekly observations. These lesson plans were created to try and create the opportunity to improve in their overall S-F ability. Through this overall purpose the following research questions were created; 1) whether target activities appear to assist in improving the skills of striking and throwing in SFG, 2) aid the learning of

tactics that are also useful in performing SFG and 3) add to current understanding about how the practice of certain teaching skills might be linked to the transfer of these skills and tactic between target and SFG.

### **Phase 1: Within Case, Within Cohort Analysis**

To begin the analysis, the interviews, researchers observations, field notes and the student-instructors journals, one participants data at a time, were thoroughly read to ensure that no data was going unnoticed and then highlighted based on the stated research questions, this was done through an inductive analysis. Patton, 2002 talks about how inductive analysis involves the ability to discover themes and patterns that emerge in the data through the researcher's interactions with the data. Once the data was read for the whole, read and taken notes it was then highlighted and transferred to a chart in regards to each question. Once it was transferred it was then read for the third time to look for patterns, level and type of pattern and then lastly the data was read again to combine emergent patterns into overall themes. By highlighting the questions (question one was blue, question two was purple and question three was yellow) it allowed the researcher to interact with the data and see patterns and themes start to emerge. Some of these patterns were able to answer multiple research questions so they were highlighted in multiple colours. Once all the data was coded based on the three stated research questions, the summarized data was then transferred to a chart form to allow for more manageable data. There are three tables within each section which is how the data was analyzed in phase one as each source was kept separately to see the patterns that were emerging within the forms of data.

**Research Question One.** Appendix Q shows you an example of some of the analysis that was taken from the blue highlighted data and then transferred to the chart. This is not all the data from this participant in relation to the analysis of the first research question but allows for an idea into some of the patterns and themes that started to emerge in relation to each form of data collected. When analyzing Appendix Q you can start to see the progression in the level of the participants' ability to complete certain tasks. This aids in understanding participants' baseline competencies and how the lessons may have facilitated the skills. Similar findings can be seen in other participants (Appendix V) where they had trouble with most of the activities in the first week but improvements were made throughout the weeks.

**Research Question Two.** In Appendix R, it gives an example of the data that was highlighted in regards to the second research question on the relationship to tactics in SFG. Again, this is not all the data that was collected; however, compared to the amount of data collected on skill development and the link between different forms of teaching, this question had very limited data. Through the analysis of the data within each case there is no substantial evidence to make any conclusions in relation to the use of target activities to improve the tactics. Further analysis of the research question will be done in the Phase Two across case within cohort analysis to see if there are any patterns or themes that emerge.

**Research Question Three.** Appendix S is an example from the same participant as the above two charts but it is the analysis's interactions with the third research question, highlighted in yellow. Through the use of inductive analysis patterns and

themes start to emerge across all participants, similar to Appendix Q you can start seeing the relationship between week one and the other weeks and what is being seen by all the forms of data.

Through Appendix S what can be seen beginning to arise in the data is a correlation between evidence in Appendix Q in relationship to improving striking in SFG. Appendix S shows the baseline of the participants and some of the challenges that were occurring in the activities and then through the weeks the improvements made. The interview then reiterates the data from the weeks of collection, as it is a synopsis of what happened in those weeks from the student-instructors' views. Similar patterns start to emerge in the interactions with the data in the other participants, which leads to the cross case analysis investigating whether the patterns emerged across all the participants but still within the various forms of data. Appendix T and U show an example of the themes that are starting to emerge in the data from each participant that was evident before moving towards the next two levels of data analysis. In these two appendixes it is not all the data collected from the research study but allows the reader to understand the progression into phase two.

### **Phase 2: Across Case, Within Cohort**

The first phase is followed by phase two which is consistent of across case analysis (across the six participants) but still within cohort (research and student-instructors world view). The second phase of analysis allowed the researcher to see the patterns and themes that were emerging in the data, through phase one become more evident as they could be seen through multiple sources of participants data, helping in

answering the stated research questions. Charts from phase one were then combined together where all the data from the participants in relation to each worldview was put together and further analyzed. Through this analysis it allowed the researcher to better illuminate the understanding of the phenomenon (the participants) that is being studied.

**Research Question One.** Following phase one where patterns and themes began to emerge within each case the cross case analysis allowed for the opportunity to see if there was similar patterns between all the participants. The first research question was the basis of further analyzing these patterns and themes that emerged and through the analysis there were four themes that became evident; the appearance of improvement in throwing, the appearance of improvement in striking, the appearance of improvement in bowling and the enjoyment and engagement through planned activities. Each theme will be further explained as to how it emerged in the data to get a better understanding of the phenomenon at hand.

***Theme 1: The appearance of improvement in throwing.*** The first theme that was evident was seen through these five emergent patterns that arose through the cross case analysis: aim and accuracy, fluidity of movement, stance, throwing overhand and arm extension. These five patterns were the areas in which the most improvement in relation to the skill of throwing could be seen in the participants. Each pattern will be explained and the connection to the overall theme will be evident through the revelatory phrases given. The first pattern was *aim and accuracy*, which focused on being able to hit the targets that were part of the lesson plans that focused on throwing (Appendix N). It is important to understand where the participant's baselines were before and seeing how

they improved in regards to this pattern. “No real success rather than hitting the target board but not hitting the specific targets” (Week 1, 4). This is only an example from one participant but the other five participants started with similar baselines. The following examples of data from different forms of collection show various participants and the improvements that were made in regards to both aim and accuracy. “Had good power and accuracy when hitting the ball” (Week 3, 1). “There is accuracy and aim as well as speed on the ball that is being thrown” (Week 2, 2). “Well after that you could tell their aiming was getting, like there precision in terms of hitting the targets and like hitting the target after hitting the ball” (Interview, 3). “Memorable moment I had at the target station was when they threw the ball at the Frisbee and was able to hit 2 out of 4 times” (Week 7, 6). These are four examples from the analysis however they are not all the sources of data in relation to improvement of aim and accuracy. These show how participants progressed over the weeks and how there was evidence to demonstrate this particular improvement.

The second pattern that was apparent in the cross case analysis was *fluidity of the movement*. Fluidity is the ability of the participants to not throwing in multiple steps; hips should not move and then arms for example, it should all flow together to make the most productive throw. Fluidity also includes the step with the throw where they take their front foot and lift it slightly as the start of the progression of the throwing movement, allowing for a more powerful throw if the step is included. Fluidity was lacking in the first few weeks not just the initial week as it was something more challenging to not only notice but also breakdown and create a lesson plan, this is where the participants started. “Throws in pieces with the step unless has another aspect to work on, told first step then throw they only focus on the step and over emphasizes that” (Week 3, 5). It took a few

weeks for the participants to make the connection to fluidity as well the focus in the initial weeks was on the proper stance and hitting target. In later weeks there was evidence of fluidity through their movement starting to improve that was seen through multiple sources. For example, “Seems so far that there is an improvement from week one where they would throw in 3-4 phases rather than making it one continuous motion” (Week 4, 4). “Had the step and then the swing in a fluid motion” (Week 3, 1). “Batting and throwing motions have become more fluent than previously and they were always remembering to take a step with their motions” (Week 4, 4). The pattern of fluidity of movement was noticed in the early stages where the participants were having difficulties by the student-instructors however not many of them continued to noticed the improvement and progression throughout the weeks, the last quote is the only one in particular to this theme that was from a student-instructors perspective.

The third pattern was *the stance* and the importance of having a proper stance in the ability to improve in throwing. The stance appeared to play an effect on other patterns such as the aim and accuracy, fluidity and arm extension as it put them in a proper position to be able to achieve the other aspects of throwing. It would be difficult to create necessary power, which comes from rotation of the hips if your feet are side by side, for example. The stance is also linked to the agility dots that are further discussed in the theme of appropriate and affective equipment as they create the opportunity for a proper stance. In week one in regards to participant six what is noted is that there was ‘no real stance’. In later weeks you start to see the progression into having a successful stance and then through other data collected you see that these participants were able to have the opportunity to improve in other areas of throwing (strength, aim, accuracy) now that they

had a support system. An example, “Good stance on the feet which helps because they were using the agility dots which sets the participants feet right away in the stance that you want” (Week 6, 6). “Added the agility dots and didn’t do anything to their stance as they are used to standing a certain way as in the past weeks the agility dots have been there for a proper stance” (Week 7, 4). Not all participants were able to be successful at the stance and therefore it lowered their ability to have success in other areas, as the stance is one of the most important parts of the throw due to the link to so many other patterns and skills. A problem can be seen here, “Instead of going with flexion and extension of their muscles they go like, they angulate them so they aren’t going to get their proper force out”. The initial two observations were from the researcher; however, the improper stance was noted through the interviews so and as a researcher it is extremely important because they talk about getting the ‘proper force out’. This shows that not just the researcher saw the connection to the stance but that the student-instructors did as well showing how triangulation was evident. The stance is not just about the lower body but it is about the upper body as well. The upper body plays just as big of a role as the lower as it is about posture; in other words, it would be hard to throw a ball bent over at the waist. This particular participant does not have the correct upper body posture due to their inability to have the correct lower body leading them to have less force when throwing.

The fourth pattern is the *ability to throw overhand* rather than underhand, as the overhand throw is more difficult than the underhand throw as is evident in the literature review. The participants came in using mainly the underhand throw and if they got too far away from the target would progress to a side arm throw. Many had difficulty with the

overhand throw, this was still occurring later in the weeks as well as the following examples reflect: “Throws underhand and not overhand even as distance increases.” (Week 1, 4); “Throwing underhand rather than overhand” (Week 3, 3). Similar to the other patterns that emerged through the charts, what can be seen is the progression in using the overhand throw as the weeks continued. Sample entries were: “Before tipped over was very stable on the ball and would bring their arm right back when throwing which is something that they didn’t do in the first week of this activity” (Week 3, 5); and, “He reverted to throwing with an awkward underhand but after on correction they immediately were able to recall the overhand technique” (Week 7, 3). The quote regarding balance is an example from a specific activity (Appendix N) where if participants failed to maintain their balance they could fall off a yoga ball (from a seated position). Participants also had to learn how to bring the ball back behind their head correctly because if they moved it off too much to the left or right, they might fall off the yoga ball. The activity forced them to learn where to bring the ball back over their head, as there was immediate feedback if they did not do it correctly. The quote from the student-instructor about the participants skill level reverting in regards to teaching the skill of the overhand throw shows that they did learn how to do the overhand throw and it only took one cue to get them to revert back to it.

The last pattern in relation to the overall theme of throwing is *arm extension*, meaning reaching back before throwing to create the power necessary to hit the targets and then eventually being able to transfer the skill to various game forms. The overall importance of the arm extension was not noticed in the first few weeks as it did not seem to be as important as other skills but in later weeks it became evident through the

interactions with the data how important the arm extension was on the ability to throw successfully. For example, “Good step with front foot, just doesn’t extend arms backwards as far even though the extension still isn’t all the way there is still much better than the initial weeks” (Week 5, 3). This example from Week six, participant five (“Extending arm, step throws were properly well done”) shows that in the initial weeks there was limited ability to bring the arm back and then about half way through the lesson plans there was an improvement yet the arm was not fully extended consistently. Another example was:

“WOW!! What another great week at throwing, the extension has improved so much over the last few weeks. Full reach back which created the ability to throw harder therefore creating the opportunity to hit the front wall because they were getting enough force off the throw to make that happen” (Week 7, 4).

The last two pieces of data show that in the last few weeks of the lesson planning the participants started to make the transition into extending their arm all the way behind them. The result of being able to do this was the participants were hitting the targets, even the smaller targets within larger targets.

***Theme 2: The appearance of improvement in striking.*** After phase one of data analysis there seemed to be evidence leading towards the improvement of striking through the use of the target games. When doing the cross case analysis the evidence became much more substantial as many patterns arose to help in proving that there was an appearance of improvement in the skill of striking. The visual evidence and/or

indication of pre-post improvement is characterized by the following patterns; improvement in effort, improvement in fluidity, where the ball is contacted, can they hit the targets, the follow through and proper stance. The first pattern, *improvement in effort* is not just about hitting with as much power as possible but using the correct force necessary for the activity. For example, “However hard I tried I couldn’t get him instead of just tapping the ball he would just whack it so then he would always have to run back” (Interview, 5). Every participant was different in regards to their ability to improve their effort; the participants that struggled the most were the ones that had to learn to decrease their effort as can be seen in the quote above. In other participants as they progressed through the weeks they improved on the effort necessary to hit the targets from the tee. These examples were found, “Had good power and accuracy when hitting the ball” (Week 3, 1). “Over rotates after the swing, excellent power created through the swing” (Week 6, 6). “Strength on hitting is getting much better over the last few weeks” (Week 5, 4). The last three quotes demonstrates that the participants over the course of their lesson plans started to increase their effort enough so that they could hit the targets that were a part of the striking activity.

The second pattern that started to emerge at the end of phase one (and then further emerged in the data during phase two) was the *fluidity in the swing*, which encompasses that the swing and rotation of the body move at the same time rather than one and then the next. The fluidity of the swing was evident through all the forms of data, which shows how much it stood out. Examples included: “Few times of the swing she would consistently get better and by the end she had a fluid swing rather than last week when most of the activities she did were in different pieces rather than getting the fluid

motion.” (Researcher, week 3, 4); “Had the step and then the swing in a fluid motion. Few times hit the tee over when hitting.” (Researcher, Week 3, 1); “Was able to fluently perform all the proper motions to hitting the ball, he did this with ease” (Student-Instructor, Week 6, 6); and, “I would say his rotation was better like he was able to almost like shift the weight” (Interview, 5). The most notable result in regards to this overall pattern is the similarities in what each form of data collection found across each case. Just as seen in these quotes fluidity incorporates the ability to the step, rotate and swing all in sequence rather than each in their own piece.

The third pattern embedded within this theme is *where the ball is contacted as* this can play such a vital part in the success of striking an object. Contacted too low and you might hit the tee or too high and you only get a small piece of the ball therefore possibly not creating enough power to get the object to the end goal or target. Sample entries were: “They were good at hitting the ball but it was challenging for him to hit the middle” (week 1, 6). “Was hitting extremely high to begin with” (week 1, 3). These two phrases from the data give an understanding into where the participants were contacting the ball initially. The next two phrases from the data indicate the improvements that were evident. These quotes were not the only ones evident in the data however allowed for a better understanding into the phenomenon at hand. “Still confused as where their actual zone is to hit the ball” (Interview, 1). “There is no real force on the shot they still hits accurately and consistently, they don’t hit the tee and make contact with a soft softball almost every time they hit just with no power” (Week 4, 4).

The fourth pattern, *can they hit the targets*, is about if the participants were successful at the activities. This pattern can incorporate a vast majority of skills, to be able to hit a target someone would have to be able to do most if not all of these skills: contact the ball, have correct effort, fluidity, the ability to follow through to the target, proper stance, aim and accuracy, just to name a few. As can be noticed just by listing some of the parts this pattern incorporates, it can be a hard task to achieve and was only evident in later weeks as it took time to learn some of the other skills listed above first. Some examples there were evident in the data: “This week they actually hit the wall when they swung with the bat from the tee. It was their first week hitting the ball hard enough to hit the wall” (Week 5, 4). “Well after that you could tell their aiming was getting, like their precision in terms of hitting targets and like hitting the target after hitting the ball” (Interview, 3). “Few times hit the bottom of the wall and if that was with the smaller, lighter ball that might have been a pretty hard hit” (Week 6, 4). The most notable part about the quotes is that they are all in the later weeks as it took time to learn other skills first to allow them to hit the targets. The participants that did not attend the later weeks or did not start until later in the course of data collection were unsuccessful at hitting the targets.

The fifth pattern is the *follow through*; evident in other patterns is the participants wanting to just tap the ball and having no follow through or the complete opposite where they almost do 360 degrees after swinging. Both under rotating and over rotating play an effect on other patterns embedded within the overall theme, as evident in the data. When the participants were under rotating they were not creating enough strength to hit the targets and when they were over rotating they were not consistent, as they could not

control the hit to have accurate and consistent aim and accuracy. There were activities that worked on the follow through (Appendix O) aspect of the swing and as the weeks progressed the cross case analysis shows evidence of this. Here are some examples: “Moving their arms farther away from their body when they hit which is allowing them for a better swing than previous as they are able to create power and then have a strong follow through right to the target” (Week 7, 3). “Was not over rotating this week and staying on task at the station” (Week 7, 5). Similar to other patterns the follow through is an example of a skill that only started to emerge in the data in later weeks. In the initial weeks being able to hit the ball or just being able to swing were more important than the follow through and then as the participants progressed through those skills they moved onto the follow through, if they got that far. Through the interactions with the data this particular pattern was only evident by the researcher’s observations. The student-instructors noticed in the initial few weeks the lack of follow through, even up to week five in some participants, but they never noticed the change in fluidity in the later weeks.

The last pattern that was embedded within the overall theme of striking was *proper stance*, which is also evident in the previous theme of throwing. Similar to throwing it is important in striking because a proper stance is needed to be successful at the activity and to be able to take the skills and transfer them to game play. In phase one of data collection you see stance start to emerge in each form of data that was collected and then in phase two when the cross case was done, it emerged from the data to a great extent as it was embedded within almost of the observations from all the participants. Here are some examples in the data: “Improving on balance and step” (Week 3, 3). “Much better swinging through with the shoulders down which they started doing as a

cue before they swung so that they would put their shoulders down right before they prepped to swing” (Week 6, 4). “Was able to hit the baseball to which ever direction they were facing” (Week 6, 6). Just as seen in the analysis on the improvement in throwing the stance is important but it is not just getting your feet set it is also the upper body as well. As can be seen from the second quote, lowering the shoulders before they hit made a big difference. When looking at more data from that particular participant what is noticed is that before the shoulders were lowered they could not strike the ball hard enough to hit the target, the week they were given the cue to lower shoulders they hit the target. In the last quote you can see that the stance does not just allow someone to hit forward it allows the participant to keep their options open, without a proper stance the way you hit the object is limited.

***Theme 3: The appearance of improvement in bowling.*** In phase one analysis, improvement in bowling started to appear within each case and within the cohort so when across case analysis occurred there was evidence to support the overall improvement in bowling. The two main patterns that helped the theme emerge were: proper stance and release of the ball and the proper arm movement. The first pattern, *proper stance and release of the ball* will be further analyzed but to understand the data that the research was embedded in you have to understand where the participant’s baselines were. “Lean almost seemed to be counterbalancing the wrong foot forward so that the shot stayed on the right path” (Week 1, 5). “Bends at the waist instead of bending knees” (Week 1, 5). These first two pieces of data represent the stance aspect of the pattern where one is reflecting the importance of the lower body and one the upper body. Here is two quotes

showing the way in which the participants were throwing the ball: “Throws ball as if to bounce first instead of rolling it along the ground” (Week 1, 2).

“I found that when we just did bowling by ourselves, I think and they didn’t really, I think that they had the most difficulty at that one because they would bowl it but sometimes it would be way off to the side, sometimes I guess he wouldn’t release it on the ground so he would like throw it” (Interview, 6).

The following two errors reflect the way in which the participants were releasing the ball, which is linked with the stance. The stance leads them to be in a certain position that eliminated various options of releasing the ball or at least made it challenging. The errors made within other cases paralleled these same mistakes that lead back to the stance and release of the ball. If you look at the specific lesson plans for bowling (Appendix J) there was a focus on the stance, particularly the knee bend as most participants tended to bend at the waist. Paralleled with the knee bend was the release, getting the ball low to the ground so that it could roll instead of bounce. There was improvement seen as the weeks progressed through multiple sources of data collection. Here are some sample entries that were seen in the data: “Each time was stepping and throwing the ball with a knee bend which is different compared to the first time because they would just bend at the waist and then would throw the ball from there” (Week 7, 5). “Didn’t even sit but forced the knee bend and they didn’t want to sit on the ball” (Week 5, 3). “One foot in front of the other when throwing bent right down and then rolling the ball” (Week 7, 4). These quotes show the importance of the stance and the bending of the knees to get low and

then how that progresses into the rolling of the ball, seen by the third piece of data. The proper stance allows the participants to get low to the ground; the feet are not shoulder width apart with their non-dominant foot slightly ahead of the other. This stance allows for the proper bending of the knees, other stances did not allow for the knees to bend only a lean. Shown in the pieces of data above is that the stance occurred first before the proper release of the ball could occur, based on the weeks in which it happened.

The second pattern that reiterated the overall theme and that became evident through the charts that were created in phase one was *importance of the arm movements*. By arm movements what is meant is that the participants were reaching back with the ball and not just letting it drop out of their hands to allow the power to knock the pins over. These quotes are an example: “Sit made him reach back far on the swing, he extending his arms all the way back to create the power to throw the ball” (Week 5, 3). “Great step then throw, brought the ball back before throwing” (Week 7, 4). “Brought it all the way back and then throw the ball which forced the knee bend again by using the yoga ball” (Week 7, 5). The quotes show not only that the participants were starting to bring their arm back but also what the results were from doing that movement. It allowed them to create more power, which in terms of bowling would most likely result in knocking more pins down, creating successful opportunities.

***Theme 4: Enjoyment and engagement throughout planned activities.*** The fourth and final theme is a bit different than the others as it is about enjoyment and engagement and not about skill development but it is still an important and noteworthy theme that arose in the data. The first pattern that correlates with this theme is, *wanting to stay at the*

*activity*. It would be difficult to try and work on the skills if the participants did not want to be at the specific stations that were designed for them and started to have meltdowns. This however is not an unusual occurrence as before this study, out of all the stations, target is the station that majority of participant did not want to stay at especially not for a long time. Some examples were: “Almost too easy and did not find activity engaging at all, they were a little too easy” (Week 1, 6). “Tendency to just do the exercises quickly and if they did not work they would want to move on to another station instead of consistently trying to master the challenge” (Week 1, 6). These pieces of data show you how the participants would typically do the target station, as quickly as possible, most likely because they struggled the most at this station. As the weeks progressed there is a change in the participants and their eagerness to stay at the activity. This made it easier to complete that day’s lesson plan, which in turn meant they had the opportunity to learn more skills or continue to practice one or two particular ones. Some examples of enjoyment and engagement were: “Well by the end they actually liked going to the target station, like they would ask to go there when it wasn’t like time so that was good” (Interview, 4).

“Since they were having such a great week their targeting station went really well because they wanted to be there and they were trying really hard. It was one of the first weeks that I saw them get excited when they were success and it was also one of the first weeks they knew then they were successful” (Week 7, 5).

The above two quotes give you an understanding into the changes in engagement and enjoyment at the activity that were made. There was a willingness to be at the target stations and a willingness to try the new activities that they were given, this is not easily achievable.

The second and final pattern is *not melting down at the target station*, since this is the station in which a majority of meltdowns happened. Meltdowns occurred, as the participants knew they would have to work on skills that they did not have or were extremely weak in. The two quotes below are from participants that would have meltdowns or get frustrated on a regular basis in later weeks of the study. These are some entries give from the data: “Seemed engaged throughout the lesson and was having a good time at the target station, no complaining, wanting to leave or meltdowns” (Week 3, 5). “Was not getting as frustrated with the activities as they have in the past” (Week 4, 1). Similar to the other pattern of wanting to stay at the station by not melting down it meant the participant was able to stay at the target station for a longer period of time. This gave the student-instructor time to complete the activities set out on the target lesson plan creating the opportunity to improve on more skills, allowing for more chance of success.

**Research Question Three.** Through putting the data into chart form in the previous phase it allowed the patterns and themes to start to emerge and then once the data was analyzed across the cases for similarities and differences between all the participants then patterns and themes were further confirmed. Being able to see the observations, field notes and interviews within one chart allowed the researcher to be able to make inferences based on what was noted by the researcher and student instructor’s

observations. Using the third research question as the basis of analysis, themes and patterns emerged to help in elaborating and understanding the phenomenon at hand.

***Theme 1: Appropriate and effective teaching techniques.*** The first theme that was noted in the data was based on five patterns that were evident in the observations made by the researcher and the student instructors. The patterns will be described to make the connection to how the researcher created the overall theme. The first pattern that was noticed, *the type of activity chosen*, meaning that the lesson plans that were created to help improve the participants overall skills played an effect on the way in which they learned the skills. “Overall goal was to get the participant to bend their knees before throwing the bowling ball, also made the participant roll the ball rather than actually getting low and rolling the ball” (Week 2, 2). The lesson that week included an activity where the participant had to take part in a bowling replicated activity where they first had to sit on the yoga ball and then roll the ball (Appendix I). This activity allowed the participant to start to learn the motion of being able to bend their knees and getting low to the ground to roll the ball. A second example is given from a different participant, in relation to different learned skills and from the student-instructors journals. “By having to pick the ball up from the shape was forced to bring their arm back further when they were throwing, this did not necessarily increase their accuracy but their technique was better” (Week 6, 4). The above quote illustrates that the participant was learning how to extend their arm, which will allow them to have an overall, more effective and efficient throw, as they need the arm extension to create the power to throw the object. The last quote, below, is from a different source of data, the interview, which gives understand to how evident this pattern, was in the data.

“When we first started out it was a little too easy for them, as you, well in first semester it was pretty much the same throughout the whole, all the days. Second semester was a lot better I thought because like every week was changing a little bit. It is not good for those guys but obviously but it challenged them a bit more and then I guess they got frustrated after that so I think we are at the right level for them in terms of difficulty level at least” (Interview, 1).

The quote alludes to the fact that the lesson activities got progressively better and that they eventually reached the correct ability level at least for this particular participant. The first and last weeks were baseline tests to see the skills needed and their improvements, depending on the week. The data shows that the lesson planning was important as to the results that you got from the participants.

The second pattern that relates to the overall theme is the *use of progressions* to help the participants in learning the skills and becoming success at the activity. By progression what is meant is that you allow the participant to learn one thing at a time rather than teaching all the skills at one time. Multiple skills together is overwhelming to them, by breaking down the skill into various parts and teaching each one separately and then combining them together it will allow the participant to have more overall success.

“ First started with just the throw and then they added the step into the throw which was a great progression as the participant was better able to make the connection and made the transition to the step easier as they

already knew how to do the throw so wasn't overwhelmed" (Researcher, Week 6, 5).

This piece of data demonstrates how the student-instructor took one part of the skill of throwing and focused just on the upper body and then once that was successful added the lower body. It shows that it does not only overwhelm the participant it also allows them to be successful through learning in pieces. There was only evidence of progression in the researcher's observations on a weekly basis however the student-instructors talked about it in their interviews.

"It took a while for them to grasp the motions and put them together fluidly but I think about the second or third time you could really tell they were like getting it together like it is not just step and then pause and then next step and then pause it is like a one fluid motion. I would assume like after a while every time we had to do the same target activity we had done the week before or something like that they could tell immediately, they started from a point that was not as bad as the week before"

(Interview, 3).

The points made by the students through the interviews lead the researcher to make the conclusion that teaching with progressions better allows the participants to be more successful at the activity. The first quote from the data collected shows how you teach part of the activity and then once successful move onto the other part and then combine together and its ability to improve success. The second quote talks about the progression of doing an activity one day and then doing it again the next day also seeing the

improvement in skill. There are two different forms of progressions but both shows that they have allowed the individual to have more success at the activity at hand.

The third pattern that arose out in the data was the *use of visual and verbal technique* as an aid in teaching the lessons to the participants. Through the quotes what can be noted is that the participants need more than just either visual or verbal instruction, they need the combination of both together to allow for optimal learning of the skills and tactics. Here is an example of how after just verbal instruction was not working the student-instructor then proceeded to add visual learning;

“Put hands on rib area when learning how to rotate and then helped him rotate which seemed like a great area for him to help as the waist sometimes gets in the way but the ribs the participant barely noticed that they were being helped” (Researcher, week 4, 3)

By adding the assistance to the movement the student-instructor allowed the participant to feel how to do the activity properly. A demonstration can also be just an effective, depending on the participant in adding to the verbal instruction. “ Student-instructor then demoed again and got him to extend farther back when reaching back, this made him create and even better for production/strength on throwing” (Researcher, week 6, 4). The participant was able to see how the person teaching them would do that particular skill and then was able to replicate that creating success at throwing. There can be success through just using one form but the most effective is the combination of the two forms of teaching techniques. To add to the data that was seen here is two pieces of data from the student-instructors, which adds to the evidence that the combination of the two forms of

teaching techniques, is most effective. “Followed the instructors and demonstrations very well and had little to no difficulty accomplishing any desired movements. Raising difficulty levels did not seem to throw off their success significantly either” (Week 6, 5). “As soon as I kind of helped him out with the actual technique, it was ridiculous he was hitting the little plates every single time” (Interview, 3). These two pieces of data just reiterate what the research analyzed proving its significance.

The fourth pattern that relates to being able to teach appropriately and affectively is the concept of *teaching through games*. Through this method of teaching it allows the participants to have better overall success and to learn the skills and then eventually make the transfer to more game-like play. This particular pattern was noted just in the interviews as one of the questions that were asked was directed towards the topic of game-like activities and if they believed they were an important teaching method.

“I couldn’t think of a better way to doing it to be honest, I mean kids like that they do enjoy playing, I don’t know if they have the opportunity to play with other people as often as you would think so it is something that is engaging and entertaining for them and that being said I feel like being engaged and entertained in something that you do that has some sort of benefit will kind of increase your probability of reaping the benefits from the activity itself, so think it is probably one of the best ways to educate or teach kids like that” (Interview, 3).

“With this population yes games is something that makes it kind of better I guess you know something if you are just doing skills it is hard to me to

just show them that throwing at this target is not what I am looking for right. I am trying to teach you how to properly throw, that comes, accuracy and precision come later in life, they never came first” (Interview, 1).

“Everybody needs the games first right, or else where does your interest come from? If you don’t like it, if you like it then you get more interested into it” (Interview, 1).

These above quotes really illustrate the importance of games to this population and not just teaching through skill based but rather using games to further enhance their skill but also allow the participants to enjoy what they are doing. There is one more piece of data that is important to see as well. It is a way to keep them engaged as it is game like but also being able to embed skills and tactics within the games that can be further developed to help them progress. “Everybody needs the games first right, or else where does your interest come from? If you don’t like it, if you like it then you get more interested into it” (Interview, 1). This last quote to me as a researcher summarizes all the data because they really show the importance of games. First we want people to be interested, not just this population and then once they are interested we can start to use that to teach skills.

The fifth and final pattern, *transfer to other activities*, was also only evident in the interviews as they got the opportunity to talk about if they saw their participant taking any of the skills they learned in target and transferring it to other activities. This

particular pattern is important as it illustrates if they learned the skills in the lesson plan and which ones in particular they learn more than others, if any.

“Ya actually I always ended up playing a game of catch of something like that in the pool with them and you could tell after a while I was just like, the first couple session they would always throw the ball underhand or they would throw it in a really really awkward manner but after that we would go into the pool and I would be like alright let’s play a game of catch and they were like ok and the first time I think it was the 3<sup>rd</sup> week, they grabbed the ball and right away they overhand threw it to me. I was like oh that’s awesome” (Interview, 3)

The evidence from the data shows the link between throwing and swimming as the most prominent. “Their swimming got much better in terms of, I mean towards the end” (Interview, 5). These two quotes from the data show you that the participants started to take the motion of the swing (throwing, badminton, tjouckball) and apply that within the swimming portion of the day. The swimming portion was also before the target station during the Saturday sessions so the participants would have to remember from the week before.

***Theme 2: Appropriate and affective equipment.*** In relation to this particular theme there are four patterns that were evident throughout the data; agility dots, objects used to hit the targets, size of targets and use of equipment to elaborate movements. Each pattern will be further described to assist in the understanding of how this theme emerged in the data. The first pattern that arose was the *agility dots* which is a piece of equipment

that you can put on the floor that the participants can then put their feet on in the correct stance. The agility dots were used in the second week because what was noticed in the first week was that almost all of the participants did not have feet shoulder width apart, with one foot slightly in front of the other. The stance is the basis for all the necessary skills, without the stance the ability for the participants to be fully successful at activities like throwing or bowling for example would be very limited, as seen earlier in this chapter. The first quote will give you an understanding of how the participants stood before the agility dots. “When they tried to throw underhand they had the wrong foot forward and did not change the foot for their left hand” (Researcher, week 1, 1). Now that there is an understanding of the baseline of most participants by adding the agility dots in further weeks there is a drastic change in the participants overall ability levels. Here are examples: “The agility dots also seemed to make a more powerful throw” (Researcher, week 2, 1); “Feet stayed in the correct position the whole time as the participant had an actual visual this time” (Researcher, week 2, 2); “ Slight improvement from last week as there was a base of support this week and the feet were set in a correct position by the agility dots so when throwing was more successful just struggling with the movement” (Researcher, week 2, 4); and “Didn’t even need agility dots for her stance anymore they got right into the staggered position when she had the ball” (Researcher, week 7, 4).

Listed above are four quotes from the data, which seems like quite a few compared to the amount of pieces of data shown in other patterns but that leads to the importance of the stance. One observation is that the data shown is only from the researchers observations; the student-instructors did not notice the stance and the effect of the agility dots. The other observation can be seen in the last two quotes, both from the same participant. As

can be seen in week two they were still having trouble getting used to the agility dots and how they changed their movements. In week seven the progression can be seen to how they have now learned the proper stance through the use of the agility dots.

The second pattern, *objects used to hit targets*, encompasses the size, the weight or the height of the object as they can all play an emphasis on the success at the activity. These three factors can also change the ability of the participant to properly learn the technique needed in doing the activity properly and keep improving over a long-term period. The next two quotes from the data show some of the difficulties seen with the objects. “Doing activity with small medicine ball, probably too heavy if was bringing that far over their head. Could be once it reached because they were not strong enough to resist the forced” (researcher, week 1, 5). “No backswing with the beanbag could be because they are light and no not need much back swing to make them go far” (Researcher, week 1, 4). Both quotes give an example related to the concept of the object not being the correct weight. The top one is too challenging which means they will not be learning the skill, as they cannot achieve it properly. The bottom one is too easy so they also do not have to have the proper technique as they can get the object to the target throwing anyway. The following three quotes, that became evident through the interactions with the data, show the changes made to the objects that were used. “Few hits the student-instructor adjusted the height of the tee which was better as the participant had a better chance of hitting the ball and not knocking over the tee” (Researcher, week 3, 1). “His instructor changed his racquet so that it was larger than badminton racquet which helped with the increase in success rate on hitting the bird and keeping the rally continuous” (Researcher, week 4, 3). “It has been hard because we haven’t thrown too

many small things to catch but I noticed it was much easier for him to brace, when he caught and um, let me think” (Interview, 5). The above three quotes give you an example of the height of an object and the size of the object and how these play a vital role in the participant being successful. By changing to a larger racquet, for example the participant was still achieving the goal of the station and was more successful and engaged.

The third pattern, *the size of the target*, is important in the participants overall ability to be successful and stay engaged. This one seems a bit obvious when you think about it but sometimes it is what is the most obvious you forget about. You can still make the target smaller within a larger object, giving more than one option so that all people can be successful and if they miss the smaller object they still hit within the larger. The lesson plan (Appendix O) uses a hula-hoop and puts a Frisbee inside the hula-hoop, either option the participant is successful, even if they are aiming for the Frisbee and hit inside the hula-hoop. In the initial week of observations it was noticed that the size of the targets were playing a major factor on success and the participant’s engagement at the activity. Here are some examples: “Need larger targets” (Researcher, week 1, 1). “The target board itself might be too difficult as the holes are not that large” (Researcher, week 1, 1). These are two examples of how the researcher noted that the equipment was causing difficulty in the activity; in later weeks by changing the equipment there was more success. “Much better than the target board from the first week as there is more chance to be successful” (Researcher, week 3, 1).

As can be seen through the progression in the initial week the researcher noticed that the participant was not having success with the activity because the targets were too

small. Their technique might have been all right but the design of the activity does not allow that to be shown. By changing the size it allowed for success, which was noted, and then the participant got feedback as they were now hitting the targets. The participant would then continue to be engaged at the activity as they were getting the feedback and praise necessary. This was not only noticed in only one participant, the quotes taken from the data just allow for evidence of the progression through the weeks.

The last pattern that was part of the overall themes was *the use of equipment to elaborate movements*. Particular lesson plans (Appendix N & O) used objects such as shapes or pylons to elaborate the arm extension or to practice the proper rotation, for example: “Getting the pylon to the X each time and actually making them hit the ball with better accuracy” (Researcher, week 4, 1); “Was getting the hang of hitting over the shape and the follow through” (Researcher, week 4, 1); and “By having to pick the ball up from the shape was forced to bring their arm back further when they were throwing, this did not necessarily increase their accuracy but there technique was better” (Researcher, week 6, 4). The first two quotes are from one participant and the last is from a different participant and as you can see they show examples from both the pylon activity and the shape activity and how they worked on the appropriate techniques. The pylon activity was working on rotation as they had a pylon around their waist and had to stop when they swung and it pointed to the X on the wall and the other was to work on reaching back to allow for arm extension. Not only did the activity work but it also allowed the participants to increase their overall abilities. Another observation made by interacting with these quotes and the other data from different participants is that sometimes the importance of the choice of equipment to create an affective and

appropriate lesson are not thought about. Equipment needs to be altered for different activities and for different participants depending on their abilities. It may take a week or two to figure out what is the most effective equipment to teach but going back to something lighter or smaller will allow for the success and the ability to perform the proper technique. The achievement is in making the equipment heavier or larger in size for example. Each participant in this study did not use the same equipment to elaborate movement as they did not need it or they needed a different type of activity. The quotes above show you have equipment can be used in various forms to teach a particular skill.

***Theme 3: Dynamic of the participants and the student-instructors.*** The participant and student-instructors were essential in this study; just based on that fact alone the dynamic of each separately as well together played an effect on the result. The first part is looking at the *participants* as they are the phenomenon at hand and just as to be expected they each came in with their own unique qualities about them.

“Their accuracy is what actually kind of throws me off because they actually still make it that is why I feel like they umm, not wanting to use our technique or the proper form because they kind of figured out some way to go and reach the target” (Interview, 1).

This is an important quote from the interview as the student-instructor was starting to realize that these participants have gotten away for a long time with just being able to get the object to the target. Most people around there were content with them doing the activity not necessarily doing it correctly, so they learned to be able to reach the target with or without the proper technique, trying to find success. This could be why this

population struggles with SFG as they had the ability to hit the targets but not with proper technique. As the activities got increasingly harder their technique could not keep up with the level necessary to succeed, at some point you need the technique to be able to participant in SFG.

The other important pattern was the *student-instructors* as a substantial amount of data collection was coming from them and they were the ones delivering the lessons. They were with the participants from start to finish, they were the ones that got to know them the most meaning they played a major role. Just like the participants each student-instructor was different and this creates variations in the amount of quality that you get depending on student-instructors. “Well, I don’t have much background in this stuff so like, when I look at something I don’t look at all the mechanics behind it really” (Interview, 6). “To me their technique is more important than anything” (Interview, 1).

“Ya in terms of like accuracy their throwing is not too bad, it is not too bad, it is just the way they throw it. When they were using the proper form they were just getting frustrated and I don’t know I still haven’t found a way to explain it to them that will make it click and that will make the connection” (Interview, 5).

Each student-instructor had his or her strengths and weaknesses that became evident through the interactions with the data. From the first two quotes what can be seen is someone that admits to not having much experience and another that knows exactly what they believe is the most important aspect of skill development, both have pros and cons. The last quote also shows a struggle with the teaching side of the lesson plans. The

student-instructors did give quite a bit of data but through analysis they were strong at noticing the larger patterns and not necessary the mechanics. They had difficulties noticing patterns such as the stance or improvement in the rotation but patterns such as, can they hit the target or the step with the throw and/or hit they noticed.

### **Phase 3: Across Case, Across Cohorts**

After analyzing across case but still within cohort in phase two, as a researcher wanting to further look at the similarities and differences in the observations made in phase two to analyze what was most evident and then making inferences off that. Through phase two what was evident was the improvement of skills in throwing, striking and bowling within each case but when looking across the cohorts this is also apparent, this leads to the first theme that arose from the across case analysis, the appearance of game playing in badminton. The second theme that started emerging in phase one became more evident through phase two and then emerged within this level of analysis was consistency of attendance. The first theme was in relation to the second research question that was posed and the second theme was in relation to the third research question.

**Research Question One.** In phase two it is evident the improvement that was made in relation to throwing, striking and bowling but what is also important to notice is the similarities in the patterns; fluidity and stance are the two biggest patterns that come out in all three skills. Moving into the across cohort analysis the research starts to see the relationship to how these skills play a vital role in game play and how they can be transferred into a variety of activities. The most evident was improving game play in badminton which can be seen through the four patterns; able to hit a variety of shots,

ability to maintain a rally, able to maintain a continuous rally and good hand-eye coordination. The first pattern, *able to hit a variety of shots* means that the participant was able to incorporate movement of the feet and/or the arm into striking the object. Through the vast amount of activities (Appendixes J-O) the participants get the opportunity to work on aspects such as proximal distal relationships that then transfer over to the ability to hit a variety of shots. Listed below are two quotes from the data:

“But they did I noticed they hit a few of those where I would notice them at least trying those where before I noticed them doing an awkward swing for something where you should clearly be trying a normal swing on it. But they actually tried an underhand hit a couple times” (Interview, 5).

“Made him move more in terms of his lower body and the rest were just pivots if anything or a little side to side motion or cause you play badminton they have enough time to track it, it moves slowly, they won’t move fast but they will move” (Interview, 1).

The participants were stepping outside of their typical comfort zone, only hitting right above their head and not even attempting move and trying different shots. This was a big finding as adding movement to any skill makes it harder and they were able to transfer the skill then make it more difficult. This allows it to become more game-like as in most games you need not only the skill but to be able to move as some point as well.

The second pattern is the ability to *maintain a rally*, this encompasses hitting one or two hits back and forth before having to start the rally over again. Before the study started the participants were having trouble making contact with the bird when it was sent

over to them, even if their student-instructor tried to aim right in their zone of hitting. As the weeks progressed the participants were able to take skills learned at other stations and transfer them to the game of badminton. Some sample entries: “Badminton station they were very good at returning the birdie” (Student-Instructor, week 6, 5)

“Hard to initially to play the game as they couldn’t keep a rally but then started by hitting back and forth to get the feel of it and then moved into the activity where they had to hit and run around the net” (Researcher, week 4, 3).

For most participants this was the progression, from starting the rally they then learned how to hit it a few times and then eventually progressed into a more continuous rally. The ability to maintain a rally is important in the game of badminton as someone is not going to hit the bird directly to you every time, there needs to be movement. In the badminton activity that was in the lesson plan (Appendix L) the object was to be able to achieve a continuous rally so the initial steps included the ability to maintain a rally.

The third pattern was the ability to *maintain a continuous rally*; this was the final progression after the ability to maintain a rally was learned. As stated above the continuous rally was embedded into one of the activities in the lesson plan where they had to work with a group of people and create a continuous rally with movement. Some of the participants were not as successful as others in getting to the continuous part; some were just able to maintain a rally. The opportunity to partake in a vast majority of lesson plans played a major effect on not achieving this pattern. This was a hard skill to achieve, as it not only relies on one participant but multiple participants and their student-

instructors. After a few times with this activity most of the participants that had this activity in their lesson plans were successful. These examples show what was seen in the data: “The rally was quite continuous too which also kept the group engaged” (Researcher, week 5, 1). “Game kept going the rallies got better” (Researcher, week 6, 5). “Could make constant contact which is something that wasn’t happening week 1” (Researcher, week 7, 5). The data shows that the ability to maintain a continuous rally happened in later weeks and was not something that was achieved in week two or three because of the necessary skills that allow the ability to keep it continuous. This was a great accomplishment and not only were they making the continuous contact they were also enjoying themselves. “Smiles on faces I had never seen before” (Researcher, week 5, 1).

The fourth and final pattern is having *good hand-eye coordination* the question is how does the skills of sending and striking contribute to hand-eye coordination? The skill of sending just like catching works on tracking which makes the participant focus on hand-eye coordination. This concept will further be discussed in chapter 5; here is the evidence in the analysis that shows for the improvement in hand-eye coordination. “Noticed at how strong they were at playing badminton, great hand-eye coordination” (Researcher, week 4, 1). “Particular participant was striking better than the initial week” (Researcher, week 7, 5). The data shown here shows both the obvious analysis of hand-eye and the one that is embedded within the data. The first quote gives reference to the overall improvement in hand-eye coordination, making it more obvious than the second quote. The second piece of data is an example from when the participant was playing

badminton and to be able to improve their striking they would have to improve their hand-eye coordination.

**Research Question Three.** After the cross cohort analysis two themes became prominent in the data across all the participants and that was their consistency of attendance and the impact that made on the overall improvement and link between the skills and tactics. The other theme that emerged in the data was the particular lesson plans that each participant received. The lesson plans were specific for each participant but not all the participants got the same lesson plan, which means this could have resulted in the participants being successful in different areas.

Consistency of attendance when analyzed from a cross cohort perspective, through deductive analysis allowed themes that were already raised in the previous phases arises in the data to be major influence on the overall results. In Appendix V what can be seen is; the participant, the weeks they were at Saturday SNAP and then a brief summary of their skill level at the beginning and then how they progressed throughout the weeks to their end results. After analyzing the chart you can get a better understanding into the participant's attendance and what is most evident is that participants one, two and six were the farthest ahead in relation to overall skill ability at the end of week one data collection. Participant four was the least capable followed closely by participant three and five and were nowhere near the skill level of the participants at the top. Unlike participants one, two and six both participants four, three and five attended the most weeks. Participant four attended every week and then the other two participants only missed one week throughout the course of data collection. This

means that they only missed one lesson plan and participant missed none of their lesson plans. When looking at the column listed, progress throughout, you will start to realize that by the end the strongest participants became the ones that improved the least. The participants that were well behind them in skill ability caught up to them and in some regards surpassed them. The biggest source of analysis was participant four as they were far behind all participants and overall they made improvements that as a researcher I could not believe were even possible.

“Well out of all the participants they are the one that blew me away the most because they progressed so much over the course of 7 weeks and I believe they were the only participant that was there every single week which I think says something in of itself. I would never have been able to imagine the progress that this child has made and to the average person I am not sure they would see the progress because it might seem minimal in someone else’s eyes but it was huge in mine. The clue to get the shoulders down was a big part of the improvement and since they have been using it now as a word cue before they do certain tasks this past week you could see that they put their shoulders to their ear less at the target station almost as if they know now that in that environment that they need to keep their shoulders down” (Researcher, week 7, 4).

This quote reiterates that being able to partake in all the lesson plans allowed the participant to make the most improvement. The participants that only missed one week were just behind in overall improvement and made much more progression than the

participants that missed more than one week. In regards to the participants that missed more than one week it is saying something when they had the highest ability and were unable to make more improvements compared to people with less ability.

### **Summary of Results**

Now that you have seen where the data was taken from, how it was coded and the themes that emerged throughout the weeks of collection the next step is giving an overall summary into the findings. The summary is broken down into each research question to allow for an understanding into the key concepts that were found in the data related to the posed questions. The summary is used to show one or two main themes that emerged and then describe why they were important in the findings.

The first research question that was posed was whether target activities appear to assist in improving the skills of striking and throwing in SFG and through the evidence in the data, the answer would be yes they do assist in improvement. Through the emergent themes; appearance of improvement in throwing, appearance of improvement in striking, appearance of improvement in bowling, enjoyment, and engagement, throughout planned activities and appearance of game play in badminton it enabled the researcher to make an affirmative conclusion to this research question. When looking into the reasons as to how these themes became emergent in the data it will allow for a better overall understanding as to why the conclusion was yes. First, is the appearance of improvement in throwing as it seemed to improve which was apparent through enhanced areas that saw improvement such as; aim, accuracy, fluidity of movement, stance, throwing overhand, arm extension, and the step with the throw. These developmental pieces are what it takes to have a

consistent and successful throw towards a target, allowing for success. The second theme evident was the appearance of improvement in striking which consisted of facilitated improvements seen in; strength, fluidity in the swing, contacts on the ball, ability to hit the targets, follow through, proper stance, contact location of the ball and where the ball is contacted. Similar to the throwing the above improvements were all a necessity in creating a successful strike to not only hit the ball but also to hit the target. The third theme was the appearance of improvement in bowling, which was broken down into proper stance, release of the ball, and arm movements. Focusing on a cross-analysis of the first three themes (since they were related to skills specifically and apparent in phase two) what was the most prevalent development was the stance and the fluidity of motion between all three themes. The stance played a large part in the analysis as the research found that it was not just about the lower body but also about the position of the upper body that makes a proper stance. Following the previous themes was the fourth theme (enjoyment and engagement throughout planned activities) that was also seen in phase two of data analysis. Two main points came out of that theme: wanting to stay at an activity and not “melting down” at the target station. Both points are significantly big achievements as the target station was the one station that the participants seemed to dislike the most, as that is where most “meltdowns” would occur. The participants did not want to be there because they either disliked the activities or they were weak at them. The last theme that became apparent in phase three of analysis was the appearance of game play in badminton. These were three main points that came out in the data, the ability to maintain a rally, ability to maintain a continuous rally and have good hand-eye coordination. These developments really showed the improvement in the skill because

playing badminton is not easy to learn. It also shows how through improving in the areas of striking, throwing and bowling (seen in phase two) the participants were then able to take those developmental pieces and apply them to more game- like play.

The second research question was focused on whether target activities appeared to aid the learning of tactics that are also useful in performing SFG. The results for this question did not have enough substantial evidence to make any overall analysis. There was very limited data in relation to answering this overall question and the data that was collected was not enough to make any conclusive arguments. This is not to say that there is not potential for target activities to aid in the learning of activities in the future it was just not evident in this data as the skills and link came out at the forefront.

The third and final research question that was posed was whether target activities would add to current understanding about how the practice of certain teaching skills might be linked to the transfer of these skills and tactics between target and SFG. In summary of this particular research question there were four main themes related to this question that arose in the data; consistency of attendance, appropriate and effective teaching techniques, appropriate and effective equipment, and dynamic of the participants and student instructor dynamics. A brief outline of each theme will allow for the important aspects to be evident, in relation to the consistency of the attendance the biggest point was that the more times that someone came to the program the more likely they were to make the biggest improvements. The second theme (appropriate and effective teaching techniques) is related to the way in which an activity was taught (there progressions, the type of activity chosen, the use of combining verbal and visual

instruction, or teaching through games as a way in which to allow for greater improvement if certain techniques were used). The results demonstrated analysis brought out the theme of appropriate and effective equipment which focused on making sure the equipment was set up to allow for success. Results also reflected that equipment was an important factor that could easily be adjusted to allow for success (e.g., adding agility dots to allow for the correct stance, using the correct size of objects, correct weight, adjusting the size of the target, the height of the tee, and using equipment to elaborate the movements). The last emerging theme that was evident was the dynamic of the participants and student-instructors. The first part was the participants as they each came in with different abilities and experiences. Some were stronger than others, some had already created their own techniques to getting the object to the target, or some had no experience at all. Since they were the main focus of the study each participant was unique and that affected their results. Similarly, the student-instructors each had their own unique characteristics. For example, some had no experience and had varying degrees of; having a physical education and background, having different undergraduate training, and having different overall experiences working with this specific population. All these factors played an effect on the way in which student-instructors taught the lessons that were designed for the participants.

## Chapter V: DISCUSSION

There are gaps in the literature pertaining to ASD and aspects of physical activity including games skills, particularly S-F skills and the ways in which to assist in teaching these skills. This study starts to fill those gaps and begins to explore the relationship between target and SFG. The guiding research questions are to determine whether target activities appear to assist in improving the skills of striking and throwing in SFG and the learning of tactics for SFG while also adding to current understanding about how the practice of certain teaching skills might be linked to the transfer of these skills and tactics between target and SFG.

In this chapter the results will be discussed relative to existing literature pertaining to each of the research questions in this study. Future directions for this line of research will be discussed and recommendations will be made for practitioners working with this specific population to help them to improve their S-F skills. In the results chapter, the findings were broken down into three phases to elaborate how the research went about taking the field notes, observations, student's journals and interviews and getting the results. As the researcher it is important to go back and look at the main points that should be discussed in regards to each research question to get a further understanding as to what they mean in relation to the results and how it can affect professionals in later studies.

In linking the results of this study to the existing literature it is important to note Mitchell, Olsen & Griffin's (2006) statement that games can be used as a way to teach a variety of skills and tactics that can then be transferred to other games and aspects of life.

They add that both target and SFG have skills and tactics that are transferable allowing the opportunity to use skills from one to transfer to the other. This link between the two game forms is based on the skills of striking and throwing an object. These particular points prelude into the meaning of the results as it gives understanding into why target and SFG were chosen as a focus for individual with ASD. Along with understanding the meaning of the results it is also important to understand how these results affect professionals working with individuals with ASD. Throughout each research question there will also be some recommendations of ways in which to help professionals improve the success of the individual with ASD they are working with. As the researcher was embedded in not only the creation of the lesson plans for six different participants but was also able to observe the lesson plans on a weekly basis to note what worked and did not, there are a few suggestions asserted to assist others trying to improve SFG in individuals with ASD. The literature focuses on modifications (e.g., over-the-line, batters choice, longball, argoball or modified softball), which are proclaimed to develop skills and tactics (Cutnet-Smith, 2003; Gorecki, 2004; Sinclair, 2004; Butler et al., 2007; Todorovich et al., 2008). Paralleling this is literature asserting that the emphasis should no longer be about developing elite athletes but rather about creating meaningful physical education opportunities for students both with and without disability (Block, 2007; Morin & Reid, 1985; Sherrill, 1998). Despite the obvious benefits of such an emphasis, there is a lack of knowledge specifically on how to actually do so; hence, this research study that investigates how to improve teaching techniques and equipment in such individuals to enable them to enjoy the success and motivation necessary to persist long enough at the activity to learn the necessary skills.

### **Research Question One**

In regards to the first research question there were two main points necessary. The first is the stance as it may seem like the stance would only be needed to set the feet but through the research it became evident that the stance was not just about the feet but also about the upper body. Wild (1938) states that there are four main stages to the developmental sequence of the over arm throw, the first of which involves the feet in place with no trunk rotation. In the other three stages the feet stay planted and the arm and body movements start to progress, however, there appears to be a lack of emphasis in those stages on the importance of the position of the upper body. Through the results in this study it is evident that setting the feet does make a big difference as the steps would show, but it was not until one participant lowered their shoulders that the upper body became evident in the stance. After analyzing the results it makes sense that the upper body is an important part of the stance as it plays an important part in having a successful throw, the arm needs to be moving at the correct time to the hips to the shoulder and then the wrist as well. Hamilton (2000) states that;

“Research has shown that in order to achieve maximum velocity of a pitched ball, it is necessary to produce a transfer of angular momentum by movement of the pitcher’s leg, pelvis, trunk, shoulder, arm and wrist in a proper sequential order”.

This quote shows the importance of how each part of the body plays an effect on the throw, even though they start with the pitchers leg that is not the only important part. For the research that was done it was important to not only have the agility dots on the floor

for the correct foot position but also teach how to use the upper body to create one fluid motion. The stance allows the whole body to be set in a position that allows for creating the power necessary to hitting the target to be successful. When assessing the stance, it is important to understand how other professionals teach individuals with ASD to learn it. The recommendation stemming from this study is to use equipment effectively. This emphasis seems to be insufficiently emphasized in the literature yet was extremely vital in this particular study for the overall success of the participants. For example, the use of the agility dots to place the feet in the correct position was a critical learning aid, finding in the data, and a main focus for the recommendations to professionals. Beyond the use of agility dots, any safe and effective marker (beanbags, laminated feet, piece of tape) can be placed on the ground to help teach suitable and predictable foot placement. Being predictable is important for this particular population as it allows for a beginning and end so using the agility dots allows participants to know exactly what is expected of them (Ford, Riggs, Nissenbaum & LaRaia, 1994; Geckler, Libby, Graff, & Ahearn, 2000; Houston-Wilson & Lieberman, 2003). The other ways to use equipment effectively to allow for success is to use the correct size of object, the weight of the object, side of the target being aimed at (i.e., make the targets large to start and then progress to smaller), the height of the tee (i.e., make sure it is appropriate for the height of individual) and be creative with equipment that might help in elaborating a specific movement. Perhaps most difficult, if you want them to reach back to a certain point then place something to reach back to; and, if you want them to sit and adjust to a certain point then put something under them to sit and adjust towards. Providing obvious and predictable visual cues within the environment is useful.

The second pattern needing particular discussion is the necessary link between sending or striking and improved hand-eye coordination. One reason for this was the improvement of good hand-eye coordination noted in phase three during the game playing of badminton. This is also relevant to the transferability of hand-eye coordination outside target activities and into other game forms as well into activities of daily living. There is limited knowledge about how striking and throwing can improve hand-eye coordination compared to data linking transfer to engagement in meaningful movement opportunities. For example, there are concepts within each game category that transfer between each other (Todorovich, Fox, Ryan & Todorovich, 2008). Hand-eye coordination is a skill that can be transferred to other game categories and allow for more success in those categories as well. Through this study in an ASD sample, it appears that hand-eye coordination is related to tracking the ball as it requires the ability to follow the ball or use the arm to watch the ball from the point of contact to the point the ball hits the wall. When looking at the bat, the participant needs to watch the bat swing backwards in their peripherals. Then as the bat moves towards the ball they focus on making the bat hit the ball. Finally, as the follow-through occurs, the participant watches the ball's path towards the target to see if it makes contact. By being able to track the ball in S-F activities, it allows a transfer to more game-like situations such as badminton wherein one watches the shuttlecock and then brings the arm back in preparation for the swing. The findings of this study provide evidence in the ASD population that tracking is linked to good hand-eye coordination which can transfer not only to other game activities within the SFG form but most likely also to other game categories and activities of daily living.

### **Research Question Two**

It is evident through the results of this study that there is no conclusive evidence that tactics helps to aid in the learning of SFG with this ASD population. This finding is in contrast to the current research literature with “able-bodied” samples reporting that games should allow for the opportunity to create the link between skills and tactics (Mitchell et al., 2006). More specifically, tactics enhance one’s potential to understand the game enabling participants a greater likelihood of using correct techniques based on each unique situation (Bunker & Thorpe, 1986). In regards to not improving or seeing evidence of the improvement in understanding tactics, there is a possibility that the participants in this study were much farther behind in their skill level than was first thought, and that they needed to learn basic skills before they could progress into tactics. It appears that learning skills is necessary in order to improve the learning and application of useful tactics. Further research needs to be done to more conclusively answer this uncertainty.

### **Research Question Three**

In regards to the third research question, one of the points of discussion and a way that professionals in the field working with individuals with ASD can help to effectively teach is to focus on effective teaching techniques. The literature states that to make an effective program, professionals need to know the attitude that they take, have a routine, be predictable, and make the activity meaningful (Ford, Riggs, Nissenbaum & LaRaia, 1994; Geckler, Libby, Graff, & Ahearn, 2000; Houston-Wilson & Lieberman, 2003; Rizzo & Kirkendall, 1995). In the literature there is also an emphasis on when schedules

are given to the individuals with ASD, when visual and verbal cues are used, and how this can create an environment where the individual feels comfortable and can improve their movement repertoire (Schultheis et al., 2000). The literature does not, however, elaborate deeply about the visual and verbal technique highlighted in this particular study. There is also little emphasis in the literature a couple of other important factors coming out of this study; namely, the importance of the type of activity chosen (as this study seemed to signal that each individual needs something different out of an activity) and the progressions used to teach through games or using activities that foster transfer. The teaching techniques used in this study seemed to be effective in fostering the necessary skills and could be used by others to also enhance their instructional success with this population.

A final point for discussion related to this third research question is the consistency of participant attendance and how this plays a factor in the overall improvement in skills. As the researcher this can be seen as one of the most influential factors in being able to link skills and tactics and ultimately improve ability. This reinforces the importance of attending consistently because doing so allows for time to focus on multiple areas whereas missing sessions reduces the necessary time required to focus on the active time needed to make improvements.

### **Limitations**

In regards to the overall research study, there were some areas that could have created limitations. Among these were having a break in the study, the consistency in attendance, and the dynamics of the student-instructors. The first limitation mentioned is

the break in the study that happened after week two of data collection due to Christmas break. There is a possibility that in those two weeks the participants reverted on the skills that had been done in the first two weeks. The benefit, however, was that the first week was used to allow for an understanding of the baseline of each participant. In the second week a few additions were made that included agility dots but the additions were ones that could be easily added after the break. The break did allow the researcher time to plan appropriate activities based on the data collected in the first two weeks. The second limitation that was noted was the consistency of attendance, even though it was a theme in the results it can also be seen as a limitation. The reason it can be seen, as a limitation is that only one participant was able to attend all seven weeks; therefore, there was no opportunity to compare their findings to the other participants. The last limitation is that the student-instructors were each different in their abilities and this could have played a factor on the way in which the lesson plans were being taught. As stated in the methods section, the lessons were each designed specifically for the participants based on the areas they needed to work on. Before getting the student-instructors to teach the lessons they were sent via email and then explained to give ample time to review and ask any necessary questions. As previously stated, each student-instructor came in with a different background, some had worked with this population, some were physical education majors, some had never done any sort of physical activity planning before, and some had never worked with this population which made it hard to follow the lessons even with guidance. The other factor in regards to the student-instructors was their journals. For most it was their first time taking part in Saturday SNAP which was overwhelming particularly in addition to the need to get to know their participants, understand the

lessons, and then trying to teach each individual according to their particular strengths and weaknesses. This could have been why some of the student-instructors struggled with the journal responses. In regards to helping the student-instructors, the researcher tried to get the journals each week to assist them in making improvements but because the study gave them no benefit (credit or some sort of reward), or they did not see any form of benefit from participating, there was nothing to hold them accountable in regards to the quality of their journals. Finally, several student-instructors got sick or missed a week for their own reasons this meant that during that particular week of data there was no journal to relate to what the research was observing and most weeks that a student-instructor did not attend they missed important moments that would only be recorded by the researcher.

### **Future Directions**

Even with the limitations, this study has ample amount of data signalling the improvement of striking and throwing skills in SFG through the use of target activities in individuals with ASD. In other words, this study adds to current understanding about how the practice of certain teaching skills might be linked to the transfer of these skills and tactics between target and SFG. Since there was only one participant that attended all seven weeks of data collection, future research could explore whether more significant results would appear if participants attended every week. New studies could also explore how these skills develop using a small-sided game of softball or cricket in an outdoor setting compared to the indoor setting of this study. Being able to take skills and use them beyond Saturday SNAP and into different environments can be particularly important for individuals with autism to transfer them to other settings such as a classroom or outside

during recess-time. Knowing more about why individuals with ASD can or cannot engage in such transfer would also be useful to explore.

### **Conclusion**

This study helps to fill a gap in the research literature linking target and SFG by providing new insight into how target games relate to improvements in striking and throwing skills in individuals with ASD and added to the understanding about how the practice of certain teaching skills might be linked to the transfer of the skills and tactics between target and SFG. In relation to the skills needed in SFG, Fisette and Mitchell (2010) state the similarity between SFG and target activities in that they allow for more preparation time in both the set-up and pre-shot phases compared to other games but do not show that they can be linked to each other. Literature also states that targeting games work on skills such as aim, accuracy and how to protect a target, which are all part of SFG, but again there is no connection made between the two game forms (Wall & Murray, 1994). There is an understanding of the importance of SFG and how the skills within this specific games category can be transferred to other games but no link in how to teach the necessary skills of SFG (Lauder, 2001). This research study reinforces how participation in certain well-designed target activities might foster improvements in skills necessary to participate actively in SFG. For example, it appears that participating in target game activities such as bowling, shuffleboard, badminton, or throwing and striking at placed targets can help individuals with high-functioning autism improve at the skills necessary to participate in SFG.

In relation to the teaching practices, the goal of many professionals is to create meaningful movement opportunities for all individuals not just the elite, meaning that quality lessons and activities are must be provided (Block, 2007; Morin & Reid, 1985; Sherrill, 1998). One of the most challenging tasks for teachers is being able to design and deliver quality programs that can help the children reach their potential (Horvat et al., 2011). This research study can give teachers working with individuals with ASD some ideas for creating more meaningful movement opportunities through effective learning tasks. Applying certain useful teaching techniques (e.g., adjusting the size and weight of equipment, using equipment to elaborate the movements, starting with agility dots to place feet in the correct stance is a start and then progressing to not needing them) and lesson plans should foster success. Even with using the skills necessary to create an adequate program, individuals working with this population still have to be able to take a skill and break it into smaller pieces and then continue to progress (Rouse, 2009). The lessons used in this study were progressive in that they required the observation of participants' beginning (baseline) skill and knowledge, created activities to help improve, and then (as the participant improved) continued to be altered by the instructor according to the needs of the learners.

## References

- Adler, P. A., & Adler, P. (1998). Observational techniques. In N.K. Denzin & Y.S. Lincoln (Eds), *Collecting and interpreting qualitative materials* (pp. 79-109). Thousand Oaks, CA: Sage.
- Adler, P.A. and Adler, P. (1994) 'Observational Techniques'. In N.K. Denzin and Y.S. Lincoln(eds) *Handbook of Qualitative Research* (pp. 337–92). Thousand Oaks, CA: Sage.
- Almond, L. (1986). Reflecting on themes: A games classification. In *Reflecting games teaching*, ed. R. Thorpe, D. Bunker, and L. Almond, 71-72. Loughborough, England: University of Technology.
- Berkeley, S.L., Zittel, L.L., Pitney,L.V., & Nichols,S.E. (2001). Locomotor and Object Control Skills of Children Diagnosed With Autism. *Adapted Physical Activity Quarterly*, 18, 405-416.
- Block, M.E. (2000). *A teacher's guide to including students with disabilities in general physical education* (2<sup>nd</sup> ed). Baltimore: Paul H. Brooks Publishing Co., Inc.
- Block, M.E. (2007). *A teacher's guide to including students with disabilities in general physical education* (3rd ed.). Baltimore, MD: Brookes.
- Block, M.E., & Burke, K. (1999). Are your children receiving appropriate physical education? *Teaching Exceptional Children*. 31(3), 18-23.

- Bunker, D., & Thorpe, R. (1986). Is there a need to reflect on our games teaching?  
*Rethinking games teaching*, ed. R. Thorpe, D. Bunker, and L. Almond: 25-34.  
Loughborough, England: University of Technology.
- Butler, J., Sullivan, S., McGinley, S., & Vranjes, M. (2003). Danish longball: A novel  
game to introduce the batting/fielding games category. *Physical and Health  
Education Journal*, 73(3), 29-33.
- Commission on Emotional and Learning Disorders in Children (CELDIC). (1970). *One  
Million Children*. Toronto: Crainford.
- Cratty, B.J. (1986). *Perceptual and motor development in infants and children* (3rd ed.).  
Englewood Cliffs, NJ: Prentice-Hall.
- Crollick, J.L., Mancil, G.R., & Stopa, C. (2006). Physical activity for children with  
autism spectrum disorder. *Teaching Elementary Physical Education*, 17(2), 30-34.
- Curtner-Smith, M.D. (2003). A hybrid sport education-games for understanding  
striking/fielding unit for upper elementary pupils. *Teaching Elementary Physical  
Education*, 7-16.
- DeMarrais, K. (2004). Qualitative interview studies: Learning through experience. In K.  
deMarrais & S.D. Lapan (Eds). *Foundations for Research*. Mahwah, NJ: Erlbaum.
- DeMayer, M., Hingtgen, J., & Jackson, R. (1981). Infantile autism reviewed: A decade of  
research. *Schizophrenia*, 2, 359-377.
- Denzin, N. K. (1989b). *Interpretive Interactionism*. Newbury Park, CA: Sage.

- Eaves, L., & Ho, H. (2008). Young adult outcome of autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 38, 739-747.
- Emck, C., Bosscher, R., Beek, P., & Doreleijers, T. (2009). Gross motor performance and self-perceived motor competence in children with emotional, behavioral, and pervasive developmental disorders: A review. *Developmental Medicine and Child Neurology*, 51, 501-517.
- Fisette, J.L., & Mitchell, S. (2010). Framework for diagnosing student performance problems in striking/fielding and target games. *Journal of Physical Education, Recreation and Dance*, 81(8), 43-56.
- Ford, L., Riggs, K.S., Nissenbaum, M., & LaRaia, J. (1994). Facilitating desired behavior in children with autism: A case study. *Contemporary Education*, 65(3), 148-151.
- Geckler, A.S., Libby, M.E., Graff, R.B., & Ahearn, W.H. (2000). Effects of reinforce choice measured in single-operant and concurrent-schedule procedures. *Journal of Applied Behaviour Analysis*, 33(3), 347-351.
- Gesell, A.L. (1928). *Infancy and human growth*. Boston: The Macmillan Company, Inc.
- Gesell, A.L. (1954). *The embryology of behavior* L. Carmichael, (Ed.) 2nd ed. New York: Wiley.
- Gillberg, C. (1998). Asperger syndrome and High-functioning autism. *British Journal of Psychiatry*, 172, 200-209.
- Gold, R. (1958). Roles in sociological field observations. *Social forces*, 36, 217-223.

- Goodwin, D. (2001). Pedagogic reflections on how children with physical disabilities experience physical education. *Physical and Health Education Journal*, 67(1), 114.
- Gorecki, J.J. (2004). Over-the-line: An alternative striking/fielding game for understanding. *Teaching Elementary Physical Education*, 15(3), 21-24.
- Griffin, L.L., & Butler, J. (2005). *Teaching games for understanding: Theory research and practice*. Champaign, IL: Human Kinetics
- Hamel, J., Dufour, S., & Fortin, D. (1993). *Case Study Methods*. Qualitative Research Methods Series, 32. Newbury Park, CA: Sage.
- Hammill, D.D., Bartel, N.R., & Bunch, G.O. (1984). *Teaching children with learning and behaviour problems* (Canadian edition). Boston: Allyn & Bacon.
- Haubenstricker, J., & Seefeldt, V.D. (1986). Acquisition of motor skills during childhood. In V, Seefeldt (Ed.). *Physical Activity and Well-being* (pp.41-102). Reston, Va.: American Alliance for Health, Physical Education, Recreation and Dance.
- Hopper, T., & Bell, R. (2002). *The tactical framework for teaching games*. Paper presented at the Canadian Association for Health, Physical Education, Recreation and Dance Convention, Banff, Alberta, Canada.
- Horvat, M., Kalakian, L., Croce, R., & Dahlstrom, V. (2011). *Development/ Adapted Physical Education: Making Ability Count* (2nd Ed.). San Francisco, CA: Benjamin Cummings.

- Houston-Wilson, C., & Leiberan, L.J. (2003). Strategies for teaching students with autism in physical education. *Journal of Physical Education, Recreation and Dance*, 74(6), 40-44.
- Howlin, P., Magiati, I., & Charman, T. (2009). A systematic review of early intensive behavioural interventions (EIBI) for children with autism. *American Journal of Mental Retardation*, 114, 23-41.
- Jones, V., & Prior, M. (1985). Motor imitation abilities and neurological signs in autistic children. *Journal of Autism and Developmental Disorders*, 15, 37-46.
- Kamps, D., Dugan, D., & Potucek, J. (1999). Effects of cross-age peer tutoring networks among students with autism and general education students. *Journal of Behavior Education*, 9(2), 97-114.
- Kasser, S.L (1995). *Inclusive games*. Champaign, IL: Human Kinetics.
- Kogan, M.D., Blumberg, S.J., Schieve, L.A., Boyle, C.A., Perrin, J.M., Ghandour, R.M., Singh, G.K., Strickland, B.B., Trevathan, E., & van Dyck, P.C. (2009). Prevalence of parent-reported diagnosis of autism spectrum disorder among children in the US, 2007. *Pediatrics*, 124, 1395-1403.
- Kovar, S.K., et al. (2007). *Elementary classroom teachers as movement educators*. (2nd ed.). NY: McGraw-Hill.
- Kvale, S., & Brinkmann, S. (2009). *Interviews: learning the craft of qualitative research interview* (2nd ed). Thousand Oaks, CA: Sage.

- Kvale, S. (1987). Validity in the qualitative research interview. *Methods: A Journal for Human Science*, 1(2), 37-72.
- Lauder, A. G. (2002). *Play practice: The games approach to teaching and coaching sports*. Champaign, IL: Human Kinetics.
- Leiberman, L.J., & Houston-Wilson, C. (2002). *Strategies for inclusion: A handbook for physical educators*. Champaign, IL: Human Kinetics.
- Leiberman, L.J., James, A.R., & Ludwa, N. (2004). The impact of inclusion in general physical education for all students. *Journal of Physical Education, Recreation and Dance*, 75(5), 37-55.
- Lincoln, Y.S., & Guba, E. G. (1985). *Naturalistic Inquiry*. Thousand Oaks, CA: Sage.
- Malina, R.M., Bouchard, C., & Bar-Or, O. *Growth, Maturation and Physical Activity* (2nd Ed.). Champaign, IL: Human Kinetics.
- Mandigo, J. L. (2003). Using problem based learning to enhance tactical awareness in target games. Chapter in J. Butler, L. Griffin, B. Lombardo, & R. Natasi (Eds.). *Teaching games for understanding in physical education and sport: An international perspective* (pp. 15-28). Oxon Hill, MD: National Association for Sport and Physical Education.
- Mangus, B., Henderson, H., & French, R. (1986). Implementation of token economy by peer tutors to increase on-task physical activity of autistic children. *Perceptual and Motor Skills*, 63, 97-98

- Merriam, B.S. (2009). *Qualitative Research: A guide to design and implementation*.  
Jossey-Bass, San Francisco, CA
- Merriam, J. E., & Makower, J. (1988). *Trend Watching: How the Media Create Trends  
and How to Be the First to Uncover Them*. New York: Tilden Press, American  
Management Association (AMACOM).
- Mitchell, S., & Collier, C. (2009). Observing and diagnosing student performance  
problems in games teaching. *Journal of Physical Education, Recreation and Dance*,  
80(6), 46-50.
- Mitchell, S., Oslin, J., & Griffin, L. (2003). *Sport foundations for elementary physical  
education: A tactical games approach*. Champaign, IL: Human Kinetics.
- Mitchell, S. A., Oslin, J.L., & Griffin, L.L. (2006). *Teaching sport concepts and skills: A  
tactical games approach*. Champaign, IL: Human Kinetics.
- Morin, B., & Reid, G. (1985). A Quantitative and Qualitative Assessment of Autistic  
Individuals on Selected Motor Tasks. *Adapted Physical Activity Quarterly*, 2, 43-  
55.
- Morris, G.S.D., & Stiehl, J. (1999). *Changing kids games* (2nd ed.). Champaign, IL:  
Human Kinetics.
- Morse, M. M. (1991). *Qualitative Nursing Research: A Contemporary Dialogue*.  
Newbury Park, CA: Sage.

National Resource Center on ADIHD. (no date). Educational Issues. Retrieved from  
<http://www.help4adhd.org/education/rights/idea>.

Ontario Ministry of Education, Ministry of Training, Colleges and Universities. (2000).

Available at:

<http://mettowas21.edu.gov.on.ca:80/eng/general/elemsec/speced/iepstand/iedstand.html>

Pan, C.Y (2008). School time physical activity of students with autism spectrum disorders and students without disabilities during inclusive physical education and recess in Taiwan. *Adapted Physical Activity Quarterly*, 25, 308-321.

Pan C.Y., Tsai, C.L., & Hsieh, K.W. (2010). Physical activity correlates for children with autism spectrum disorders in middle school physical education. *Journal of Physical Education, Recreation and Dance*, 82(3), 491-498.

Patton, M.Q. (2002). *Qualitative Research & Evaluation Methods* (3rd ed). Thousand Oaks, CA: Sage.

Pivik, J., McComas, J., & LaFlamme, M. (2002). Barriers and facilitators to inclusive education. *Exceptional Children*, 69(1), 97-107.

Reid, G., Collier, D., & Morin, B. (1983). Motor performance of autistic individuals. In R.L. Eason, T.L. Smith, & F. Caron (Eds.), *Adapted physical activity: From theory to application* (pp. 201-218). Champaign, IL: Human Kinetics.

- Reid, G., & O'Connor, J. (2003). The autism spectrum disorders: activity selection, assessment, and program organization: Part II. *Palaestra*, 19(1), 20-27.
- Rizzo, T.L., & Kirkendall, D.R. (1995). Teaching students with mild disabilities: What affects attitudes of future physical educators. *Adapted Physical Activity Quarterly*, 12(3), 205-216.
- Rouse, P. (2009). *Inclusion in Physical Education: Fitness, motor and social skills for students of all abilities*. Champaign, IL: Human Kinetics.
- Schatzman, L., & Strauss, A. L. (1973). *Field research*. Englewood Cliffs, N.J.: Prentice-Hall, Inc.
- Schopler, E., & Mesibow, G.B (1994). *Behavioural issues in autism*. New York: Plenum Press.
- Schultheis, S.F., Boswell, B.B., & Decker, J. (2000). Successful physical activity programming for student with autism. *Focus on Autism and Other Developmental Disabilities*, 15(3), 159-162.
- Sheppard, J. (2007). Ready, aim, target games. *Physical and health Education Journal*, 73(3), 34- 39.
- Sherrill, C. (1998). *Adapted physical activity, recreation, and sport: Cross disciplinary- and lifespan* (5th ed.). Madison: WCB McGraw Hill.
- Sinclair, C. (2004). Batter's choice: Lessons for teaching tactics in a modified striking/fielding game. *Teaching Elementary Physical Education*, 16-19.

- Stake, R. E. (1995). *The Art of Case Study Research*. Thousand Oaks, CA: Sage.
- Todorovich, J.R., Fox, J.P., Ryan, S., & Todorovich, S.W. (2008). A dynamic-rules game for teaching striking-and-fielding game tactics. *Journal of Physical Education, Recreation and Dance*, 79(5), 26-41.
- Turner, A.P. (2004). Teaching striking/fielding concepts in cricket. *Teaching Elementary Physical Education*, 15(4), 10-14.
- Wall, J. & Murray, N. (1994). *Children and movement*. Dubuque, IO: WMC Brown Publishers.
- Wild, M. (1938). The behaviour of throwing and some observations concerning its course of development in children. *Research Quarterly*, 9, 20-24.
- Willis, W.J. (2007). *Foundations of Qualitative Research: Interpretive and Critical Approaches*. Thousand Oaks, CA: Sage.
- Wing, J.K. (1976). *Early childhood autism*. London: Pergamon Press.
- Wing, L. (1969). The handicaps of autistic children- A comparative study. *Journal of Child Psychology and Psychiatry*, 10, 1-40.
- Zimelman, M., Paschal, A., Hawley, S.R., Molgaard, C.A., & St.Romain, T. (2007). Addressing physical inactivity among developmentally disabled students through visual schedules and social stories. *Research in Developmental Disabilities*, 28, 386-396

## Appendix A:

### Individuals Involved (Players)

#### Researcher

**Who:** The person that is doing the research study

**Role:** The role of the researcher is to oversee the whole study which includes; training the student-instructors, creating the lesson plans on a weekly basis, setting up the target station weekly, observing the participants and collecting data through field notes and then when the observation period is complete analyzing the field notes, journals and interviews for possible emergent patterns.

#### Participants

**Who:** The six individuals ages 12-16 with high functional autism, all varying levels within the high functioning classification.

**Role:** The role of the participants was that of being observed on a weekly basis. The participants were the ones that the lesson plans were created for; they were the ones being instructed by the student –instructors on a weekly basis and they were the ones that both the research and student-instructor were observing, the study revolved around the participants.

#### Student-Instructor

**Who:** The students from Brock University working with the participants on a weekly basis. Even though they were from Brock University not all the student-instructors were from the same program, the same year and they did not have the same experience; some had no previous experience working with individuals with disabilities.

**Role:** The student-instructors had multiple roles; first and foremost they were the ones delivering the researchers lessons on a weekly basis, they were working one-to-one with the individuals on a weekly basis, they wrote weekly journals about what they were observing from the participants and they also were the ones interviewed by the researcher after the program was done. The largest amount of the data was collected through the student-instructors.

#### Parents

**Who:** The people who have consent over the participants, all the parents of the participants.

**Role:** The parents were the ones that had to sign consent for their child to partake in the study. They also had the ability to remove their child from the study, as they know their child the best.

#### Mentors

**Who:** The other masters students that were at the program and the meetings on a weekly basis.

**Role:** The mentors were there to assist the student-instructors when needed, make sure the program ran smoothly, deal with issues that arose and if during the study needed someone to help the student-instructors demonstrate an activity they might have forgotten or not be doing correctly they were there to assist so that the researcher could focus on observations only.

#### Director of Saturday SNAP

**Who:** Dr. Connolly from Brock University

**Role:** Permission from the director was necessary to be able to do the study at Saturday SNAP.

## **Appendix B:**

### **Layers of the Research Study**

#### Saturday SNAP:

Started as a program piloted by students taking a course, now a recreation service program. It is a developmentally appropriate physical education program catered to teenagers and young adults with ASD. It is built around a station-based pedagogy and runs every Saturday from 2-5pm using both a gym and a pool. The Saturday program is where the research was conducted; the gym was where the target station was set up and where the student-instructors delivered the lesson plans on a weekly basis.

#### Meetings:

The meetings were where the student-instructors were trained before taking part in the program and the research study. They were trained in how to use visual and verbal instruction, how to instruct, what to expect on a weekly basis in regards to the environment and the participants and then lastly how to deal with potential issues that might occur. Once the initial training was complete there were weekly meetings that occurred throughout the time that the program was running to talk about ‘what went well’, “what did not go well” and “what concerns did they have”. After the basis of the meetings was covered the researcher took the student-instructors aside and talked about their journals to make them stronger on a weekly basis. The researcher also gave out the lesson plans and then further discussed and demonstrated the activities.

#### Lessons:

The first week of lesson plans was used to determine the participant’s baselines; where their strengths and weaknesses were. Once that was determined the lesson plans were individualized and progressive working on trying to improve various skills. The lesson plans used various pieces of equipment to help teach the skills such as, hula hoops, cones, shapes and Frisbees to name a few. Lesson plans were created by the researcher but were given by the student-instructors on a weekly basis. Lastly, the lessons gave directions in how to teach the skills, how to use both visual and verbal as well as gave modifications if the activities were either to hard or to difficult.

#### The Data

The data was collected through field notes, journals and interviews. The field notes were done by the researcher and were descriptive in nature. They gave the

researcher the chance to express their feelings and then reflect after the day of data collection, allowed for an understanding into the experiences of what happened that day through a focus on the skills that were being taught and the way in which the teaching were being taught. The main focus of the field notes was on the participants and the student instructors, for the participants it was about looking at skills they were improving on, skills that needed to be of focus and the key moments. In regards to the student-instructors it was about the way in which the lesson was taught (were they using visual and verbal, where they using the right equipment), the cues they used and then how the participants reacted to the lessons.

The journals were the next form of data and were written weekly by the student-instructors. The journals allowed the researcher to get a better understanding into the phenomenon at hand as the student-instructors were the ones that spent the most time with the participants. The journals allowed for a different perspective than the researchers to be able to allow for the triangulation of data as well as eliminate the bias, as the results were not just seen from the researcher.

The last form of data that was collected was the interviews; these were done around a week after the program ended, depending on the student-instructors exam schedule. The interviews were used as a way to better understand feelings, thoughts or previous behaviour. It allowed the student-instructors to be able to reflect on their experiences, which created a deeper understanding into the participants. Similar to the journals, the interviews were a way in which to make the connection between the data that was seen in the observations and the field notes.

### Data Analysis

The three sets of data were analyzed; first the data was read for the whole, it was then read and notes were taken (salience), the third part was that it was read again to see the patterns, level of patterns and type of pattern and then lastly this is where similar patterns combined together to create overall themes. The first read was inductive, as a research looking for patterns that were emergent in data though either occurring multiple times or occurring once. Through analyzing the data the patterns were highlighted based on the patterns the initial patterns were then transferred to another document to further analyze. The data analysis included three phase; phase one was analysis of content within each case and within each cohort (within each participant and within the research and participant world view), phase two is a cross case but still within cohort (across the six participants but still within the two world views) and then the third and final phase is across case and across cohort (across all six participants and then across all forms of data).

## Appendix C

### Consent Materials

#### Informed Consent Template (Parents)

Date: May 27<sup>th</sup>, 2012

Project Title: Benefits of Combining Target and Striking and Fielding Activities for individuals with Autism: A Comparative Case Study

Principle Investigator:

Brittany Hogan, Master of Arts Student,  
Brock University  
289-213-5265  
[Bh07yx@brocku.ca](mailto:Bh07yx@brocku.ca)

Faculty Supervisor (if applicable):

Dr. Ken Lodewyk, Department of Kinesiology,  
Brock University  
(905) 688-5550 Ext.  
[klodewyk@brocku.ca](mailto:klodewyk@brocku.ca)

#### INVITATION

Your child is invited to participate in a study that involves research. The purpose of this study is to describe the potential benefits of combining target activities with striking and fielding games for individuals with high functioning autism through the Saturday Special Needs Program. This will be the only program that will be involved in the current study.

#### WHAT'S INVOLVED

As a participant, your child will be observed each week, only in the gymnasium on their throwing and striking skills as well as some tactical aspects. Your child will be working with a student on a weekly basis at the Saturday SNAP program where their schedule will be individually created each week based on their progressions. All observations will be written on a weekly basis. Further explanation of the purpose of the research will be discussed at a meeting held for all participants to attend before the research takes place.

#### POTENTIAL BENEFITS AND RISKS

Possible benefits of participation include information that may benefit this specific group of individuals with autism in regards to their physical activity repertoire as well as other individuals with autism. The other hopeful is that the information will help professionals in the field, working with individuals with autism. Ultimately, we are hoping to find out more about how we can improve the physical activity repertoire for these specific individuals. There are no known or anticipated risks associated with participation in this study.

#### CONFIDENTIALITY

The information you provide will be kept confidential. Your child's name will not appear in any thesis or report resulting in this study; however, with your permission, anonymous quotations may be used. Information collected during this study will be locked in a filing cabinet at Brock University as well as stored on a separate USD drive. Data will be kept for approximately two years after which time the written documents will be shredded. Access to this data will be restricted to Brittany Hogan (Principle investigator) and members of the study committee, all professors at Brock University (Dr. Lodewyk, Connolly and Adams).

#### VOLUNTARY PARTICIPATION

Participation in this study is voluntary. If you wish, you may decline to participate in any component of the study. Further, you may decide to withdraw from this study at any time and may do so without any penalty or loss of benefits to which your child is entitled. This meaning that your child may participate in Saturday SNAP without being part of the research.

#### PUBLICATION OF RESULTS

Results of this study may be published in professional journals and presented at conferences. Feedback about this study will be available to the convener of the Saturday Special Needs Program in the fall of 2013.

#### CONTACT INFORMATION

If you have any questions about this study or require further information, please contact the Principal Investigator or the Faculty Supervisor (where applicable) using the contact information provided above.

Thank you for your assistance in this project. Please keep a copy of this form for your records.

#### CONSENT FORM

I agree for my child to participate in this study described above. I have made this decision based on the information, I have read in the Informed-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time.

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date:

## Appendix D

### Consent Materials

#### Informed Consent Template (Student-Instructors)

Date: May 27<sup>th</sup>, 2012

Project Title: Benefits of Combining Target and Striking and Fielding Activities for individuals with Autism: A Comparative Case Study

Principle Investigator:

Brittany Hogan, Master of Arts Student,  
Faculty of Applied Health Sciences, Health and Physical  
Education, Brock University  
289-213-5265  
[Bh07yx@brocku.ca](mailto:Bh07yx@brocku.ca)

Faculty Supervisor (if applicable):

Dr. Ken Lodewyk, Faculty of  
Health and Physical Education,  
Brock University  
(905) 688-5550 Ext.  
[klodewyk@brocku.ca](mailto:klodewyk@brocku.ca)

#### INVITATION

You are invited to participate in a study that involves research. The purpose of this study is to describe the potential benefits of combining target activities with striking and fielding games for individuals with high functioning autism through the Saturday Special Needs Program. This will be the only program that will be involved in the current study.

#### WHAT'S INVOLVED

As a participant, you will be asked to meet with the researcher and answer approximately 10 questions. The purpose of the research will be explained at the initial meeting held before the program starts and then will be explained again before the beginning of the interview. The interview will be taped for the researcher's purposes only. Participation will take approximately 30 to 45 minutes of your time.

#### POTENTIAL BENEFITS AND RISKS

Possible benefits of participation include information that may benefit this specific group of individuals with autism in regards to their physical activity repertoire as well as other individuals with autism. The other hopeful is that the information will help professionals in the field, working with individuals with autism. Ultimately, we are hoping to find out more about how we can improve the physical activity repertoire for these specific individuals. There are no known or anticipated risks associated with participation in this study.

#### CONFIDENTIALITY

The information you provide will be kept confidential. Your name will not appear in any thesis or report resulting in this study; however, with your permission, anonymous quotations may be used. Shortly after the interview has been completed, I will send you a copy of the transcript to give you the opportunity to confirm the accuracy of our conversation and to add or further clarify any points that you wish. Information collected during this study will be locked in a filing cabinet at Brock University as well as stored on a separate USD drive. Data will be kept for approximately two years after which time the written documents will be shredded. Access to this data will be restricted to Brittany Hogan (Principle investigator) and members of the study committee, all professors at Brock University (Dr. Lodewyk, Connolly and Adams).

#### VOLUNTARY PARTICIPATION

Participation in this study is voluntary. If you wish, you may decline to answer any questions or participate in any component of the study. Further, you may decide to withdraw from this study at any time and may do so without any penalty or loss of benefits to which you are entitled.

#### PUBLICATION OF RESULTS

Results of this study may be published in professional journals and presented at conferences. Feedback about this study will be available to the convener of the Saturday Special Needs Program in the fall of 2013.

#### CONTACT INFORMATION

If you have any questions about this study or require further information, please contact the Principal Investigator or the Faculty Supervisor (where applicable) using the contact information provided above.

Thank you for your assistance in this project. Please keep a copy of this form for your records.

#### CONSENT FORM

I agree to participate in this study described above. I have made this decision based on the information I have read in the Informed-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time.

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date:

**Appendix E:****Throwing Guideline**

Stages	Description and Score of Individual (0-5)	Ways To Help Improve
Do they grasp and release		
Feet in place-no trunk rotation		
Arm and body movements go back and forth		
Arm and body movements now moving in the horizontal plane		
Movement in the right foot to prepare for transfer to the left		
Decrease in trunk rotation with increase in hip flexion		
Step forward with opposite leg as arm that is throwing		
Foot moves into preparation stage by transferring weight from the dominant to the non-dominant foot		

(Wild, 1938)

**Appendix F:****Striking Guideline**

Stages	Description and Score of Individual (0-5)	Ways to Help Improve
Grasp the racquet, bat, or club		
Proper stance, feet hip width apart		
Bring the object back in preparation for the forward swing		
Hip rotation as body weight is shifted from back to front foot		
Proper swing of the racquet, bat or club		

(Wing, 1938)

**Appendix G:**

**Tactical Guideline**

Tactical Components	Description and Score of Individual (0-5)	Ways to Help Improve
Hitting object into open space		
Hitting to a stationary target		
Hitting to a moving target		
Hitting object so it stays in play		
Hitting to score runs		
Throwing to a stationary target		
Throwing to a moving target		
Accuracy		

## **Appendix H:**

### **Interview Guide**

#### Questions:

1. How was the semester with name (of child working with)?
2. Do you think that your participant with high functioning ASD made any improvements over the course of the semester? If so, what were they?
3. In regards to each station that was planned, how do you think the target station went?
4. Did your participant with high functioning ASD seem to be engaging within the activities that were planned?
5. From your opinion do you think that any of the skills were learned?
6. Which parts did they excel at?
7. Which ones caused trouble/frustration?
8. Did you notice any of the skills being taught at the target station being used in other parts of the gym?
9. If so, what skills and at which stations? If not why do you think that was?
10. Do you think that teaching skills through games is useful for students with high functioning ASD?
11. If yes, how so?

## Appendix I:

### Overview of Lessons

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6
Week 1	Bowling (underhand), target board (underhand), hula hoops (underhand), throwing to a target (overhand), tjouckball nets, throwing into open space (overhand), striking	Bowling (underhand), target board (underhand), hula hoops (underhand), throwing to a target (overhand), tjouckball nets, throwing into open space (overhand), striking	Bowling (underhand), target board (underhand), hula hoops (underhand), throwing to a target (overhand), tjouckball nets, throwing into open space (overhand), striking	Bowling (underhand), target board (underhand), hula hoops (underhand), throwing to a target (overhand), tjouckball nets, throwing into open space (overhand), striking	Bowling (underhand), target board (underhand), hula hoops (underhand), throwing to a target (overhand), tjouckball nets, throwing into open space (overhand), striking	Bowling (underhand), target board (underhand), hula hoops (underhand), throwing to a target (overhand), tjouckball nets, throwing into open space (overhand), striking
Week 2	Not attend	Hitting the X's, throwing through hula hoops, hitting the dot, pointing the pylon, hitting over the shape	Not attend	Bowling from seated position, throwing through hula hoops, blanket catch, hitting off the tee, x's on the wall	Not attend	Tjouckball Throwing, Throwing Through hula hoops, blanket catch, hitting off the tee, base running
Week 3	Hitting off the tee, base running, seated Tjouckball, throwing through hula hoops, X's on the wall	Not attend	Hitting off the tee, base running, throwing through hula hoops, X's on the wall	Bowling from a seated position, throwing through hula hoop, hitting off the tee	Bowling from a seated position, throwing through hula hoops, seated Tjouckball, hitting off the tee, base running	Not attend
Week 4	Pointing the pylon, hitting over the shape,	Not attend	Throwing through hula hoops, hitting the dot, hitting	Hitting off the tee, throwing through hula hoop, hitting	Pointing the pylon, hitting over the	Not attend

A COMPARATIVE CASE STUDY 127

	cricket golf, pairs badminton		over the shape, pairs badminton, cricket golf	the dot	shape, cricket golf, hitting the dot	
Week 5	Reaching back, pointing the pylon and running the bases, cricket golf, pairs badminton	Not attend	Throwing through hula hoops, bowling from a seated position, reaching back, pairs badminton, cricket golf	Hitting of the tee, reach back, bowling from a seated position, hitting the object, seated Tjouckball	Pointing the pylon and running the bases, cricket golf, bowling from seated position, pairs badminton	Not attend
Week 6		Not attend	Shuffleboard, reaching back, hitting off the tee, pairs badminton	Hitting off the tee, teaching back, shuffleboard	Reaching back, shuffleboard, throwing at Frisbee's, pairs badminton	Pointing the pylon, hitting over the shape, hitting the dot, hitting the x's
Week 7	Not attend	Not attend	Bowling, hitting off the tee, throwing at Frisbee's, pairs badminton	Bowling, hitting off the tee, throwing at Frisbee's, pairs badminton	Bowling, hitting off the tee, throwing at Frisbee's, pairs badminton	Bowling, hitting off the tee, throwing at Frisbee's, pairs badminton

## **Appendix J:**

### **Bowling Lesson**

#### **Activity 1: Bowling from a seated position**

*Objects:* bowling ball, pins and stability ball (blue yoga ball)

*Set up:* put the bowling pins up and then put the yoga ball a distance away from the pins as this is where they will be throwing

**Demo first:** First sit on blue ball then roll ball on ground (go from standing position to seated and then bring arm back and throw the ball)

**Participant's turn:** First sit on blue ball and then roll ball on the ground. Alright stand back up and try again

Modifications to decrease challenge: Move closer with the ball or keep seated on the yoga ball the whole time

Modifications to increase challenge: Move farther back, increase the weight of the ball throwing, and throw from the left side of use the blue skittles instead of the bowling pins.

## Appendix K:

### Shuffleboard Lesson

#### Activity # 2: Shuffleboard

*Objects:* Triangle taped on the floor, the rings for the shuffleboard and the shuffleboard sticks

*Setup:* the triangle will be done for you, and the rings will be at the station already with the sticks

**A shuffleboard game typically has points that are 7, 8 and -10 just play it as the top is 3 then 2 then 1 and keep score of that**

Demo First: First put ring in front of stick, then push the stick forwards (they really need to see this visually)

Participant's Turn: First put ring in front of stick and then push the stick forwards so that the ring moves.

**Modification to make it easier:** Decrease your distance from the target to make the shots easier to make

**Modification to make it harder:** Increase distance; change the scoring on the board to challenge them

## **Appendix L:**

### **Badminton Lesson**

#### **Activity #3: Pairs Badminton (do with Dario and Ben)**

*Objects:* Badminton rackets (one for each), birdie, 'x' on the floor

*Setup:* You just need the badminton net and then at least 2 people on each side of the net in a line behind one another (give the front person some room to hit the bird)

You start by serving the bird over the net, that person will then run to the opposite side and go to the back of the line. The person that just got served to will then hit it back over the net in a clear type of manner and then will also run to the other side and then wait in the line. Before hitting you must make it back to the 'x' on the floor before you can hit.

## Appendix M:

### Cricket Lesson

#### Activity #4: Cricket Golf

*Objects:* cricket bat, gator ball, beach ball, football stand, shape, hula hoops, plastic cricket set

*Setup:* Put agility dots beside the ball, which is on the shape sitting in the football stand. Once the child hits the ball they will run to the cricket set behind them.

Show them the dots on the floor so that he knows where they are before he hits.

**Demo First:** First get feet set, then swing and hit the ball, then run to this (show) and run back

**Participant's Turn:** First get feet set, then swing and hit the ball, then run to this (show and run back

\*\*They are going to use an underhand almost golf like swing to hit the ball. First start with a beach ball and then if successful can try another ball. When they run back to the cricket set to touch it you can count if down like 5, 4, 3 (and that's how long he has to get back). When they get back let them get set before they hit the next shot.

**Modifications to decrease difficulty:** First just start with the golf swing and then add in the running

**Modifications to increase difficulty:** Change beach ball to a gator ball and then move towards a soft softball

## Appendix N:

### Striking Lesson

#### Activity #5: Hitting the object

*Objects:* 2 shapes, rubber bat, ball, agility dots and the tee

*Setup:* set the tee and ball up like normally to hit and then have the agility dots beside them. Have the two shapes in front where you would follow through and has to touch them after she hits the ball to work on her follow through.

**Demo First:** First hit the ball then keep swinging and hit the shapes

**Participant's Turn:** First hit the ball then keep swinging and hit the shapes

**Modification to decrease difficulty:** Remove the bat and just get her to rotate through the movement then then get them to work in phases.

**Modification to increase difficulty:** Eliminate the shapes after a few tries and see if she can do it without the shapes.

#### Activity #6: Hitting the dot

*Objects:* Ball with dot on it (I will provide that), tee, bat, agility dots

*Setup:* Put the agility dots beside the tee, set the tee up to an appropriate height put the ball with the dot on it on the tee. MAKE SURE that the dot is facing the child so they know where to hit the ball

Show them the dot on the ball before they try to hit it so that they know what they are looking for when they swing

**Demo First:** First get feet set then swing bat and hit the dot on the ball

**Participant's Turn:** First get feet set then swing bat and hit the dot on the ball

- After they hit the ball get them to place the ball back on the stand and turn the ball so that the dot is in the right position so that they also start to comprehend that they have to make contact with the ball in a certain spot to get the best possible shot

**To increase difficulty: make the ball smaller.** After a few tries try with a ball that doesn't have a dot to see if they can be just as accurate with the swing.

**To decrease difficulty:** Increase the size of the dot on the ball.

**You can try adding the touch to them as well in this one to make the connection to the previous activity**

### Activity #7: Hitting off the tee

\*\*make sure tee is adjusted to participant's height

*Objects:* tee, rubber bat, gator ball, 2 agility dots

*Setup:* put the agility dots beside the tee in the position so that their left foot is slightly in front of their right (similar to the first station so she makes the transfer)

**Demo first:** Lift front foot up, step and then hit ball

**Participant's Turn:** Do beside him so that he sees it "front foot up, and then hit ball)

**Modification to decrease challenge:** take out the step and just work in keeping feet in the correct position and rotating hips to hit the ball

**Modifications to increase challenge:** change the size of the ball to a smaller one move back farther

### Activity #8: Hitting over the shape

*Objects:* tee, bat, 2 soft softballs, 2 agility dots a shape that is low enough to hit over (I will help with this before)

*Setup:* Put the agility dots beside the tee in the position so that his left foot is slightly in front of his right, put the shape up in front but slightly off to his left so that when he is following through he will go over top of the shape

#### **DO NOT Demonstrate First Just Verbal**

**Participant first:** Step, hit the ball and then follow through over the shape

**Demo (also say the same words so they can relate):** step, hit the ball and then follow through over the shape

Now that you have demonstrated let Jacob go again and try the activity. If he still needs demonstrations you can then assist in helping him understand the activity.

#### **Modifications to increase difficulty:**

**Modifications to decrease difficulty:** change the softball to a gator ball so that it is easier to hit and that they have a higher chance of being successful. Can also get him to just practice a few times before adding the ball

### Activity #9: Base Running

*Objects:* tee, rubber bat, gator ball, 2 agility dots, 4 hula hoops, 6 beanbags, bucket, possibly a stop watch

*Setup:* Move tee farther back and then put hula hoops in a diamond shape as if they were bases, put 2 beanbags in each hula hoop and then have the bucket to finish off with

**Demo first:** first hit the ball and then run and get one beanbag in each hula hoop (the actually do it) **Dario might not need the demo see how the explanation goes**

**Participant's Turn:** Alright your turn to hit the ball and run around and get one beanbag from each hula hoop. Alright this time we are going to time you remember hit the ball doesn't matter how far you hit it but I won't start the timer until you hit the ball (can see if beat that time)

Modification to make it easier: Run with them so that you can prep them along the way to pick up one beanbag and it could make them run faster

Modification to make it harder: Use a softball instead of gator ball, actually go run and get the ball and then they have to beat you or stop when you pick up the ball

### Activity #10: Pointing the Pylon and running the bases

*Objects:* tee, bat, 2 soft softballs, 1 pylon, agility dots, rope, hula hoop on wall, 3 hula hoops with beanbags

*Setup:* Tie the pylon to the child's waist so that it is near their belly button area, the hula hoop will already be set-up, get the tee to the child's height, set agility dots beside tee and then set the three bases up so that he would run to them

**\*\*before he starts to swing the bat just get him to practice just rotating to swing towards the 'X' so he knows where he is aiming for and what it feels like when he actually rotates his body correctly**

**Demo First:** First swing and point pylon at the 'X' then run and get 1 beanbag from each hula hoop

**Participant's Turn:** First swing and point the pylon at the 'X' then run and get 1 beanbag from each hula hoop

**\*\*When they finish the swing make sure you ask them 'is your pylon pointing in the hula hoop**

## Appendix O:

### Throwing Lessons

#### Activity #11: Hitting off the tee

**\*\*make sure tee is adjusted to participant's height**

*Objects:* tee, rubber bat, gator ball, 2 agility dots

*Setup:* put the agility dots beside the tee in the position so that their left foot is slightly in front of their right (similar to the first station so they make the transfer)

**Demo first:** Left front foot up, step and then hit ball

**Participant's Turn:** Do beside them so that they see it "front foot up, and then hit ball)

#### Activity #12: Seated Tjouckball

*Objects:* yoga ball, light medicine ball, Tjouckball nets, handball

*Setup:* put yoga ball at a distance away from the Tjouckball nets

**Demo first:** first sit on the yoga ball then lift hands overhead and throw ball at net

**Participant's Turn:** First sit on the yoga ball and then throw the medicine ball from over your head

Part 2: Try this a few times and then change to handball and get her to try and only use one hand to throw the ball instead of both, can also see if a light medicine ball would work too

Safety Considerations: Just watch to make sure that when the ball is coming back that Dario isn't having trouble catching it while staying balanced on the yoga ball as this can be unsteady especially if the ball comes back not directly at him.

#### Activity #13: Throwing through hula hoops

*Object:* soft softball (little heavier than beanbag)

*Set up:* Put agility dots down on the ground so that he has to place his feet shoulder width apart but make him start sideways

**Demo first:** First knee up then throw (so he can see visual)

**Participant's Turn:** First knee up, step then throw ball (can do it in front of them so he was visual as well, get them to step on the agility dot)

**\*\*When they are doing this activity they doesn't have a fluid movement in your throwing so you are going to assist them in that by helping them move through the throw\*\***

**Modification to decrease challenge:** move closer to the object, just work on rotating and throwing the ball rather than stepping with foot

**Modification to increase challenge:** see if she can hit any hula hoop and if he is successful then try and pick certain hula hoops that he has to throw at to make it more challenging

Activity #14: X's on the wall

*Objects:* different color x's on the wall, medicine ball

*Setup:* have the x's marked out already on the wall

**Demo First:** This time we are going to hit all the red x's as we move across the wall (will be at different heights)

**Participant's Turn:** Alright hit all the green x's, follow me

**Modifications to decrease the challenge:** decrease the weight of the ball or go to a gator ball, decrease the distance from the wall

**Modifications to increase the challenge:** Increase the weight of the ball or increase the distance with the same weighted ball

Activity #15: Throwing at Frisbee's

*Objects:* Soft softball, 3 hula hoops, 3 Frisbee's, 3 agility dots

*Setup:* Put out the agility dots for foot placement, put the third in front of the foot closest to the wall. You want them to hit the Frisbees which are inside of the hula hoops.

Same activity as the throwing to the hula hoops except now the Frisbee is the target and it will be inside of the hula hoop. Now the target is half of the size as it was before.

**Demo First:** First reach back, then throw the ball and step onto the third agility dot (demo will be really important)

**Participant's Turn:** First reach back, then throw the ball and then step onto the third agility dot (demo will be really important)

**\*\* What you can also do is if he is unsuccessful in throwing to the target you could make them run and touch something and then come back so that he focuses on throwing to the target.**

Activity #16: Reaching Back

*Objects:* Ball, Shape placed behind them, the hula hoops in front of them, agility dots

*Setup:* Put the shape with the ball on it behind them so that they have to fully extend their arm before they throw it.

**Demo First:** First reach back and grab the ball with one hand and then throw the ball

**Participant's Turn:** First reach back and grab the ball with one hand and then throw the ball

**You want the ball back far enough so that he has to fully extend his arm and then throw the ball. Can do it where you first start without the ball behind him and then add the ball**

**Appendix P:****Should Achieve**

<b>Activity</b>	<b>Should Achieve</b>
Bowling from seated position	Knee bend, release of ball, arm extension
Throwing through hula hoops	Aim, accuracy, follow through, rotation, stance, step, fluidity, arm extension
Blanket catch	Tracking
Hitting off the tee	Tracking, aim, accuracy, follow through, rotation, stance, step, fluidity, back swing
X's on the wall	Strength, aim, accuracy, arm extension
Hitting the dot	Hitting the ball in the correct spot
Reach back	Arm extension, step, rotation, fluidity, strength
Hitting the object	Aim, accuracy, fluidity, rotation, stance, strength, making contact with ball
Tjouckball	Arm extension, strength, stance
Shuffleboard	Aim, accuracy, follow through, stance
Hitting over the shape	Height of the swing, follow through
Pairs badminton	Rallying, aim, accuracy, tracking
Cricket golf	Back swing, follow through, aim, accuracy, stance, fluidity, rotation
Base running	Swinging and then running, rotation, fluidity, strength, aim, accuracy
Pointing the pylon	rotation
Throwing at Frisbees	Aim, accuracy, strength, proper throw

**Appendix Q:**

**Phase One, Research Question One**

Participant 1	Researcher's observations (week 1)	Researcher's Observations (week 5)
Skills	<ul style="list-style-type: none"> <li>-Opposite foot to his dominant hand when he throws the ball (bowl)</li> <li>-Bends at the waist instead of bending knees (bowl)</li> <li>-Two foot stance to throw from the closest hula hoop, even though quite close it was not a high success rate (target)</li> <li>-Not very successful hitting the bird very big swings when the bird was coming towards them which made them miss quite a few shots as the swing was not complete by the time the bird got to them (bad)</li> </ul>	<ul style="list-style-type: none"> <li>-Love this game (bad)</li> <li>- some great striking happening and the participants are engaged the whole time and I think that it is because there is more to the activity than just hitting the bird (bad)</li> <li>-Thought the addition of the bases would turn out better but they weren't as good as the first time (tee)</li> </ul>

Participant 1	Student-instructor Journals (week 1)	Student-instructor Journals (week 5)
Skills	<ul style="list-style-type: none"> <li>-Very coordinated</li> <li>-Activities accomplished almost perfectly upon the first explanation</li> <li>-Enjoyed trying to best his previous tosses and throws which also lead to a highly efficient and enjoyable atmosphere</li> </ul>	<ul style="list-style-type: none"> <li>-Showed great body pivot and foot placement during his hits albeit with some reminder</li> <li>-Showed great improvement in their running time during the cricket station with each subsequent hit</li> </ul>

Participant 1	Interview
Skill	<ul style="list-style-type: none"> <li>-It always went well like there was some of it he would be so, especially because of the hitting or the throwing he was so eager to do it I found that he wouldn't necessarily pay attention to you know the, you know you would be demonstrating the motions and you would do it again and I would see him looking away and then I would demonstrate again and he would get a bit frustrated but I mean but he was supposed to see that proper sequencing</li> <li>-And I would say his rotation was better like he was able to almost shift the weight</li> </ul>

**Appendix R:**

**Phase One, Research Question Two**

Participant 1	Researcher's observations (week 1)	Researcher's Observations (week 5)
Tactics	<ul style="list-style-type: none"> <li>-Doing activity with small medicine ball, probably too heavy if was bringing that far over their head (TJ)</li> <li>-Could be once it reached a certain point backwards the weight of the ball just brought their arms back even farther because they were not strong enough to resist the force (TJ)</li> </ul>	<ul style="list-style-type: none"> <li>-More tired he got through the better he got at the activity because then he was focused on doing it correctly (cricket)</li> <li>- Like the use of the beach ball to hit because they couldn't hit it that hard to hit the wall and then bounce back that far but they have to hit it with quite a bit of power to reach the wall (cricket)</li> </ul>

Participant 1	Student-instructor Journals (week 1)	Student-instructor Journals (week 5)
Tactic	<ul style="list-style-type: none"> <li>-Complete all the required tasks and activities in the target station</li> <li>-Can be prone to frustration if he is unable to complete a task with ease or feels he should be able to accomplish a task with ease and is unable</li> </ul>	<ul style="list-style-type: none"> <li>-Generally speaking all days seemed to be a success. Josh managed to complete all required activities with reasonable amounts of demonstration even after difficulty levels were greatly enhanced</li> </ul>

Participant 1	Interview
Tactic	<ul style="list-style-type: none"> <li>-Ya I just, there is a lot of things I felt positive and I felt that he made improvements</li> <li>-So he learned pieces of it which makes the skill better</li> </ul>

**Appendix S:****Phase One, Research Question Three**

Participant 1	Researcher's observations (week 1)	Researcher's Observations (week 5)
Link	<p>-At certain points seemed disinterested in the activity as they were not trying hard to hit it on certain colours that his student-instructor was telling him to hit. Some of it could have been was that there was no real reward or other stimulation for hitting the parachute. The student-instructor did not react when he made the colour he asked but he might have needed that stimulation to understand that he was successful (parachute)</p> <p>-Never got upset at any of the stations which is good because then I know that the activities were not so challenging that the participant was unsuccessful and getting frustrated</p>	<p>-really good job when they added a time task to the activity where they would time him and then show him how fast he was (cricket)</p> <p>- Smile on all their faces that I have not seen this semester. A smile is harder to get them most people would think out of this population so a smile was a big deal this week (bad)</p>

Participant 1	Student-instructor journals (week 1)	Student-instructor journals (week 5)
Link	<p>-Enjoyed trying to best his previous tosses and throws which also lead to a highly efficient and enjoyable atmosphere</p> <p>-Vast majority of the stations could be called a success because not only did Josh follow instructions almost perfectly but he accomplished all said activities with a high degree of precision and effort</p>	<p>-Generally speaking all days seemed to be a success. They managed to complete all required activities with reasonable amounts of demonstration even after difficulty levels were greatly enhanced</p> <p>My partner and I's insistence that they gather the balls themselves and not pick up a bat until we were ready to hit seemed to aggravate him</p>

Participant	Interview
Link	<p>- And I felt like we did make some improvements which was good and I feel like despite his complaints when he shows up and is, he seems like he had a good time with it too even though I was working him hard. I think that was important too, that he was enjoying it as well as getting worked hard.</p> <p>-But he really liked that one and all of a sudden I didn't even know, I didn't even have time to finish go run and he was already up at the wall so, he liked those</p>

	ones too -So he learned pieces of it which makes the skill better
--	--

**Appendix T:****Phase One Themes for skills****Researcher**

	<b>Matt</b>	<b>Shaun</b>	<b>Jackson</b>	<b>Josh</b>	<b>Simon</b>	<b>Christina</b>
Throwing	Arm extension, follow through, accuracy and aim	Underhand not overhand, no hip rotation, hitting inside the targets, good step with throw, improvement on accuracy, by last week had step then throw, fluidity	Good backswing, good strength, , good back arm extension, fluid motion, good power and accuracy, good rotation, hit targets, better strength in later weeks	Initially not a high success, two foot stance, good back swing, lean to one side as increased distance, throws in pieces, in later weeks good extension backwards, great aim and accuracy, better extension, took step then throw	No step when throwing, good rotation	Initially throws underhand, starts throw above the shoulder, not fluid motion, as the weeks progressed they got more fluidity, increase in ability to hit the targets, better rotation, increase in strength, bending knees, arm was back before throwing
Badminton	None	Difficulty initially, later weeks improvement seen in maintaining rally	Good hand-eye coordination, struggled initially, great striking, maintaining continuous rallies	Big swings, as weeks progressed rallies improved, parallel play, enjoyment	Difficulty with hand-eye coordination, not very successful	None

Striking	Moved to smaller ball, increase in distance from target, understanding of body placement in relation to the tee	Hitting high to start, bend at waist not the legs to start, no arm extension in early weeks, improvement on balance and step, chokes up on bat, by last week was good at accuracy, consistency in hitting targets	Extremely frustrated initially, bat at same level to start, no step, no pivot, lack of accuracy, in later weeks got step, improved on power and accuracy, did not hit the tee as many times	Makes good contact, over rotates, stepped with foot and then hit ball with accuracy and power, by last week was not over rotating	Trouble hitting the ball, stand sideways, no ability to stop rotation, step into shot, successful at hitting smaller ball, over rotates still in later weeks, makes good contact, depends on follow through and contact on ball for the success, good strength	Does not hit with much power, as weeks progressed more fluidity, stiff when hitting, better rotation, not much strength, consistent at hitting the ball off the tee, one week hit above the target, better follow through, still by the end of the weeks had trouble with swing
Cricket	None	None	Good extension, good swing, hits with power, making contact each time	Hits hard, hit with accuracy	None	None
Shuffleboard	None	Holds stick like hockey stick, getting better as practiced	None	As practiced seemed to improve	None	Did well at hitting targets, took a few times to get better
Bowling	Step with the throw, follow	Didn't even sit forced	None	Initially leaning to	None	Bending at hips not

	through, increase in distance	knee bend, sit made them reach back farther		one side and bending at waist, as weeks progressed good arm motion, brought ball all the way back, knee bend, step with throw		waist, tend to lean to one side when throwing, by the end was bending knees better, correct foot placement, great step and throw
Stance	Started wrong foot forward, progressed to correct foot, now that foot change does not push ball	None	Good knee bend	Initial weeks as the increased distance feet got closer together	No real stance in initial week, by the end had good stance without the agility dots	Started with wrong foot forward, increase in distance feet move closer together, by the last week did not need agility dots to get correct stance
Other	Engaged in the activities, enjoying the activities	Better overall engagement	Increase in willingness, enjoyment improved, less frustrated	Seemed engaged, wanted to be at the stations	enjoyment	Enjoying the stations, says out loud 'hit then step'

**Student-Instructor**

	<b>Matt</b>	<b>Shaun</b>	<b>Jackson</b>	<b>Josh</b>	<b>Simon</b>	<b>Christina</b>
Throwing	Wanted to throw beanbags as	Struggle with bending of the knees,	Consistent in hitting targets,	Minor with problems, extending arm	No difficulty hitting	Struggle with target, great aiming skills,

	was accomplishing quickly	fluidity, improvement in accuracy	strong accuracy	step throws were properly done, better fluidity	target, good with smaller ball, still good as increased distance	struggled with sequence of tasks, more fluent, problems bringing arm back
Badminton	None	None	None	Quite memorable because excelled in using the badminton racquet, performed well, good at returning bird	Not able to maintain rally	None
Striking	None	Struggled with precise targeting, stiffness in body, consistently able to hit targets	His weakness	Showed great form in swing, need occasional reminders about fluidity,	Consistent in using proper motions to hitting the ball, able to hit with power and precision, hit in various directions	Few good bats
Cricket	None	None	None	Showed great improvement, completed all required steps	None	None
Shuffleboard	None	Able to use stick with both hands, excelled	None	None	None	Very good at shuffleboard
Bowling	None	Struggled with movements, no fluidity	Accurate with right arm	Great ease with standing/seated bowling	Good at hitting bowling pins	Strengths were aim with bowling, better at bowling in the

						last week than other weeks, hitting pins consistently
Stance	None	None	None	None	None	None
Other	None	Engaged tracking ability and coordination , engaged	Weakness in technique and form, most of tasks were successful	Eagerness to participate in activities, very coordinated, success at target stations	Good sense of hitting targets, finished activities with little trouble, tasks were successful	Cooperative and willing to try the activities, large improvements , wanted to keep playing at target and did not want to move to next station

**Interview**

	<b>Matt</b>	<b>Shaun</b>	<b>Jackson</b>	<b>Josh</b>	<b>Simon</b>	<b>Christina</b>
Throwing	None	Aiming and precision better, consistency of hitting targets	Don't know if understands point of left footed step, throwing seemed to revert	His throws got much better, liked to do the throwing activities, learned pieces of it	None	Still does not like the throwing and batting, some days better than other, got better at throwing
Badminton	None	None	Good at the game, hitting was good	Got better working as a team, better at hitting at awkward angles	Lack of engagement	None
Striking	None	Aiming was getting better	Struggles the most, confused where his hitting zone is, hitting	Could not get him to hit with the correct force, decent hit, rotation	Strong with baseball, struggled with fluidity	None

			for height was doing well	improved		
Cricket	None	None	None	Better at following steps, good swing	None	None
Shuffleboard	None	As practiced got better at doing this activity	None	None	None	Really liked shuffleboard
Bowling	None	None	None	Accurate throws, consistent	Struggled with this activity the most, had trouble releasing the ball on the ground	Liked the bowling activity,
Stance	None	None	Sometimes uses wrong foot on step, does not really understand	Rotation was better, better at shifting weight	Struggled with fluidity but started to noticed their own mistakes and would stop movement and start over	None
Other	None	Made improvements,	Most of the time it is pretty good	Made improvements, learned pieces of it which makes the skill better	None	Liked going to the target station by the end

## Appendix U:

### Phase One Themes for Teaching

#### Researcher

	<b>Matt</b>	<b>Shaun</b>	<b>Jackson</b>	<b>Josh</b>	<b>Simon</b>	<b>Christina</b>
Type of Equipment	The yoga ball emphasized the bending of knees, blanket was too big, larger targets allowed for success	Changed racquet so it was larger and it allowed for increase in success rate, first did activity with beanbags and then moved to soft softballs	Need larger targets, target board itself might be too difficult, few hits adjusted height of the tee which was better, targets better than the target board as more successful, pylon to the 'x' each time actually making them hit the ball with better accuracy	Small medicine ball was probably too heavy, pylons hard to rotate with as quite large, like the use of beach ball to hit as had to hit it hard, time task helped activity	Hula hoops might to too large, ball was too small, make sure tee is at correct height	No backswing with beanbag could be too light, need something in front of them so they cannot bend forwards, started with bigger ball then went to smaller ball
Type of activity chosen	Enjoyed the base running	Activity forced knee bend, loved game (badminton)	Balance between being too easy and too challenging, frustrated if tee was not correct, timing seemed to help, knew made contact with	Good base running since object to bring back, ball worked well as made them sit and roll ball, shapes need to be placed more in front, game is so busy	Like to be challenged but did not realize challenge can mean they might not be successful	Challenging as sensitive to noise, loved this game as it was different from any of the other activities

			ball could run from base to base, thought this activity was most engaging for them (badminton)	(badminton) and do not stop moving		
Agility dots	Agility dots were amazing, had correct foot forward, agility dots allowed them to be able to throw the ball and have a follow through, better feet position seemed to lead to better accuracy, aim and a stronger hit	Feet initially in position as if ready to skate, agility dots worked well	When throwing underhand they had the wrong foot forward in initial weeks	By the last week same distance with their feet without the agility dots now	Made transfer of feet to various activities, seemed to make a more powerful throw, feet staying still on the agility dots, tried step with agility dots and worked well, created a base of support	There was a base of support, feet set in the correct position, in the last week did not even need agility dots
Progression	Medicine ball to start might have been too hard, another activity switched to smaller ball was successful	Much focus on certain parts of throw making struggle with making one motion, works well with progressions from A to B then from B to C and	Good power second time around, making contact each time when progressed to the smaller ball	When tell about step then focuses too much, after doing once or twice then is more fluid, should have started activity without bat and just practiced rotation, first	Few times tried to lift the foot and decreased accuracy, no real time to make progressions	Might have helped hitting off tee first as it worked on fluid motion, too focused on step to begin after a few hits started to get the fluidity, second time

		then A and B with C, after non-dominant went back to dominant side and did better after switch, great job teaching in phases, phasing seemed to help with success		started throw then added step and then step and throw was more successful, progressions allowed for more success		at activity was hitting farther
Visual and Verbal	More successful when they got praise and recognition	Put hands on rib area when learning how to rotate, student-instructor demoed again and got him to extend farther back	None	None	None	None
Teaching Technique	None	None	None	Flicked wrist instead of throwing, try instructing less next week as to get right into the activity, find ways for activities to be more purposeful, great job demonstrating	Good at hitting targets after being told which target to hit	Assisted by going from behind and helping them, assisted through throwing and hitting, showed them where to hit on the wall so they had a focus, cue to lower their shoulders

Length of Instruction	None	None	None	None	None	None
-----------------------	------	------	------	------	------	------

**Student-Instructor**

	<b>Matt</b>	<b>Shaun</b>	<b>Jackson</b>	<b>Josh</b>	<b>Simon</b>	<b>Christina</b>
Type of Equipment	Beanbags were successful	None	Frustrated with the tee	Enjoying trying to best his previous tosses, difficulty catching ball	None	None
Type of activity chosen	Wanted to throw beanbags as they were successful	None	If not successful would get frustrated and lose interest, some stations were a bit easy	Issues with fatigue, success at badminton station	Weakness is that he loses concentration especially if activity was too easy, when as baseball would ask to change stations	Really struggled with the hula hoop toss, by picking ball from the shape was forced to bring arm back farther
Agility dots	None	None	Usually stand with weight on one leg, legs usually together not shoulder width apart	Showed great body pivot and foot placement during their hit with some reminders	None	None
Progression	None	None	Tasks were successful after changed made to technique	None	Improved gradually with every try	Batting was much more improved on the trials done directly after they were shown

Visual and Verbal	None	Ability to emulate the motions that were demonstrated, replicate demonstrations	Needed more help and advice, listens to advice and tried to apply, accepted advice and made changes to their technique	None	None	None
Teaching Technique	None	None	None	Activities accomplished almost perfectly upon explanation, enjoy trying to best his previous tosses, easier to demonstrate the activities, generally needed the initial demonstration in order to perform movement, followed instructions and demonstration	Did not need many demonstrations, able to comprehend and perform tasks by verbal instruction only, strengths are his ability to take instructions and translate them into actions	Stood in front of them and had them throw beanbags to my hands, responded well to demonstrations,
Length of Instruction	None	None	None	None	None	Other students yelling and screaming would bother them and interrupt the

						activity
--	--	--	--	--	--	----------

**Interview**

	<b>Matt</b>	<b>Shaun</b>	<b>Jackson</b>	<b>Josh</b>	<b>Simon</b>	<b>Christina</b>
Type of Equipment	None	None	None	Easier for them to brace when cause with smaller ball	Give them a bigger ball to throw at it and he would hit it perfect	Wanted a certain colour of ball on the tee and would make the activity more successful
Type of activity chosen	None	None	First started out was a little too easy, second semester was a lot better, good lesson plans were progressing	Could have been nature of game as there is people waiting on you (badminton)	Having trouble making it more difficult, do not think they really wanted to play badminton	None
Agility dots	None	None	Trying to fix feet position	None	Found did not really use agility dots as he would slip on them	None
Progression	None	Took a while to grasp the motions and put them together fluidity by the second time was getting it, every time we had to do the	None	Learned progressions from listening to student-instructor	Knew the progression by that is the only way he would do it	None

		same target activity started at a point that was not as bad				
Visual and Verbal	None	None	Tired to show difference in power they get from step, trying to show them videos as examples, if telling them they would go and do task,	Got much better listening to multiple steps	Showed them what to do	
Teaching Technique		None		Eager to do the hitting or the throwing, used demonstrations to assist in the teaching, at beginning did struggle with multiple instructions	Just had to tell them remember you have to lift your foot and then do all this and they would do it	Always trying to correct the swing and could never just like do it
Length of Instruction		None	Came for the first 3 weeks and then was off the last couple two or three	None	Only been with them 2 or 3 times as they had not been there a lot	None
Transfer to other activities		None	None	Their swimming got much better towards the end		Improved quite a bit in target and swimming, tried front crawl and it is kind of related to throwing and

						by end was better at doing that
Participant		None	Accuracy is what throws instructor off as actually still makes it to the target	Easy to work with and more cooperative		Pretty agreeable and listens to most things
Activities learned		None	None	None	Ya so he remembered from the previous time what to do and the steps	Feel like learned the shoulders
Game Skills		None	With this population games is something that makes it better, I believe repetition will bore people, for us it is playing around first until you learn how to throw, game first or else where does the interest come from	Critical in making them do better making it competitive, for them more game-like, seemed to love the game aspect or loved the challenge aspect	Helps a lot because found that they enjoyed a lot more than just telling them what to do	If more like classroom environment they would not want to do it, think they would get sick of it right away
Student Instructor	None	None	Technique is more important than anything, still haven't found a way to explain it	Been rewarding and fun, a great experience	Do not have much background in this stuff, do not know all the mechanics	None

## Appendix V:

## Consistency of attendance

Participant	Attendance <i>In weeks</i>	Ability at Beginning	Progress Throughout (skill)
1	1,3,4,5	<p><b>Throw:</b> good backswing even with increase in distance, no step, increase resulted in side arm flick</p> <p><b>Strike:</b> not successful, no step, no change in swing, lack of accuracy, over-rotation</p> <p><b>Bowl:</b> accurate with right hand</p> <p><b>Bad:</b> good hand eye, lack of ability to maintain a rally</p> <p><b>Stance:</b> good knee bend, good feet position</p> <p>Frustration through activities</p>	<p><b>Throw:</b> good arm extension, had step and swing in fluid motion, good power and accuracy, good rotation, good arm extension</p> <p><b>Strike:</b> What a difference, step and swing in fluid motion, good power and accuracy, does not hit tee as many times</p> <p><b>Bowl:</b> no improvement</p> <p><b>Bad:</b> great hand-eye, great striking, engaged throughout, continuous rally</p> <p><b>Stance:</b> Still struggling with the stance and proper footing</p> <p>Seemed to enjoy the activities, smiling at times even, no meltdowns from frustration</p>
2	1,2	<p><b>Throw:</b> pushing instead of throwing, no follow through, no accuracy</p> <p><b>Strike:</b> close distance, large ball</p> <p><b>Bad:</b> nothing</p> <p><b>Bowl:</b> throws to bounce, no step just lift, increase in distance changed the approach</p> <p><b>Stance:</b> same foot as throwing hand</p> <p>Engaged in activity</p>	<p><b>Throw:</b> throwing the ball, follow through, accuracy and aim</p> <p><b>Strike:</b> changed to smaller ball, increased distance, able to make adjustments for other side of tee</p> <p><b>Bowl:</b> no practice yet</p> <p><b>Stance:</b> correct foot forward, stance corrected parts of throwing</p> <p>Enjoyed activities more as were more successful</p>
3	1,3,4,5,6,7	<p><b>Throw:</b> no rotation, no arm extension, no step, no consistent hitting</p> <p><b>Strike:</b> hitting extremely high, bending at waist, lack of step</p> <p><b>Bowl:</b> bend at waist, no arm extension backwards, incorrect footing</p> <p><b>Bad:</b> unable to maintain rally, unable to start</p>	<p><b>Throw:</b> started throwing underhand vs overhand, hitting targets consistently, good step with foot, good with dominant and non-dominant, more fluid motion</p> <p><b>Strike:</b> improve balance and step, better arm extension and follow through, great striking, good accuracy, hitting ball almost every time, move arms away from body when hitting</p> <p><b>Bowl:</b> slight knee bend, reach back when rolling, still struggles a bit, better staggered foot</p> <p><b>Bad:</b> when in game was able to maintain rally,</p>

		rally,	better as weeks progressed  Better engagement throughout the activities
4	1,2,3,4,5,6,7	<b>Throw:</b> throws underhand not overhand, no success on hitting targets, no follow through, not fluid motion <b>Strike:</b> not much power, over rotates, not fluid, not proper follow through <b>Bad:</b> no results <b>Bowl:</b> bend at the hips, slight swing, lean to one side, improper stance <b>Stance:</b> wrong foot forward, distance increases feet get closer	<b>Throw:</b> great arm extension, great strength, step into shot, pretty good accuracy, follow through with throw, bent knees, could hit all three hula hoops, <b>Strike:</b> good swing, hits ball almost every time, hit the target, improvement on hitting, better follow through, good swing, shoulders down, stills with the consistency of hitting the ball with enough strength <b>Bad:</b> no results <b>Bowl:</b> better job of bending the knees, great step then throw, brought ball back before throwing, great targeting, used a smaller ball than gator ball and still hitting pins <b>Stance:</b> better rotation with proper stance, by the end feet stayed in the correct position without the agility dots  Challenging as they did not have success as the other participants, enjoying the stations
5	1,3,4,5,6,7	<b>Throw:</b> not high success rate from close, leans back to far, throw form decreased as distance increased <b>Strike:</b> no step, over rotates with torso <b>Bad:</b> not very successful at hitting bird, big swings, missed quite a few shots <b>Bowl:</b> lean to one side (almost to counterbalance), good stance, bends at waist, decrease ability when increased distance <b>Stance:</b> close footing, increase distance footing get closer	<b>Throw:</b> good extension in arm, increase in strength, aim and accuracy, got the step and then throw <b>Strike:</b> over-rotating until final week, increase in strength, good contact on ball, got step and hit <b>Bad:</b> continuous rally, able to start rally, great striking, enjoyment at activity <b>Bowl:</b> good arm motion, bent the knees with throwing, took step <b>Stance:</b> great pivot and foot placement, same distance without the agility dots by the end  Seemed engaged throughout all activities, good mood the whole time
6	1,2,6,7	<b>Throw:</b> No step, good rotation <b>Strike:</b> trouble hitting, over-rotation, good starting point of bat <b>Bad:</b> lack hand-eye, no real success <b>Bowl:</b> Lean to one side, no consistent <b>Stance:</b> no stance	<b>Throw:</b> Hit Frisbees <b>Strike:</b> hit smaller ball just not correctly, over-rotating, follow through at different levels, good strength, strongest skill <b>Bad:</b> still hard time starting and maintaining a rally, lack of success <b>Bowl:</b> most difficulty, not releasing on ground <b>Stance:</b> good with agility dots, without them go back to side by side Was enjoying themselves at target