

# **UNIVERSITY OF EDUCATION, WINNEBA**

**IMPROVING OVERARM THROWING SKILL AMONG KINDERGARTEN  
PUPILS THROUGH SELECTED TRADITIONAL GAMES IN ESAU OFORI  
PRESCHOOL OF AKUAPEM NORTH DISTRICT, GHANA**

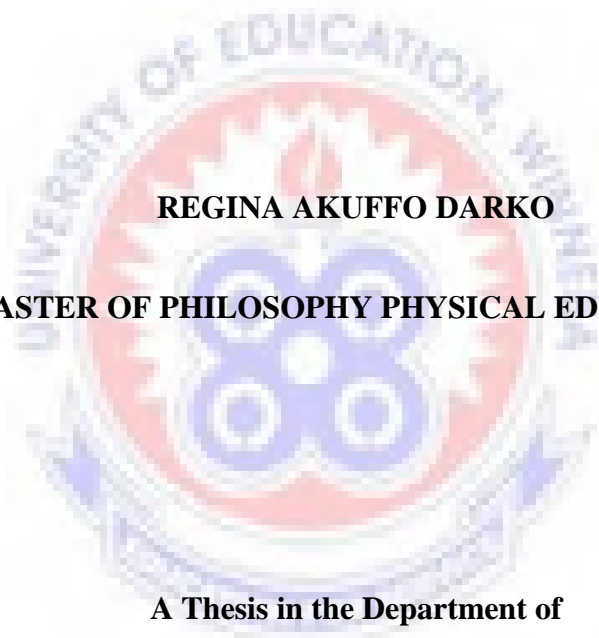


**REGINA AKUFFO DARKO**

**JULY, 2012**

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**MASTER OF PHILOSOPHY PHYSICAL EDUCATION**

**A Thesis in the Department of  
HEALTH, PHYSICAL EDUCATION,  
RECREATION AND SPORTS, FACULTY OF SCIENCE,  
submitted to the School of Graduate Studies, University of  
Education, Winneba, in partial fulfillment of the requirements for the  
award of the Master of Philosophy in Physical Education Degree**

**JULY, 2012**

## DECLARATION

### STUDENT DECLARATION

I Regina Akuffo Darko declare that this thesis, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

SIGNATURE: .....

DATE: .....

### SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of thesis as laid down by the University of Education, Winneba.

NAME OF SUPERVISOR: DR. PUFAA H. A

SIGNATURE: .....

DATE: .....

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## **ABSTRACT**

The purpose of this study was to find out the effect of selected traditional games on overarm throwing skill performance among kindergarten two pupils. A single group pretest posttest, quasi experimental design was used. Target schools for the study were 119 public preschools in the Akuapem North District in the Eastern Region of Ghana. The Sample size for the study was made up of 37 kindergarten two pupils from one public preschool which was selected using purposive sampling technique. Data was collected using Test of Gross Motor Development -2 (TGMD-2) instrument designed by Ulrich in the year 2000. It is a norm-reference test designed to assess the fundamental motor skills of children between the ages of 3 to 10. The process and product measure of overarm throwing skill was assessed by observation (video recording) and coded with the TGMD-2 instrument. A dependent t-test statistical method was used to analyze the overhand throw performance at both the pretest and posttest stages with alpha level set at 0.05 for two tailed test. Also, a two sample t-test assuming unequal variance was used to analyze the gender difference in pupils overarm throwing performance at both pretest and posttest stages. The results of the study revealed that traditional games have a significant effect on kindergarten two pupils' overarm throwing skill performance. Also, the findings of this research indicated that traditional games help improve upon pupils overarm throwing skill performance with a moderate effect of 4.59. It is therefore recommended that traditional games should be incorporated into the teaching of fundamental motor skills in the early childhood years of schooling in Ghanaian schools.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background to the Study**

Children learn and develop through dynamic interaction with their environment and the tasks they experience. The physical education lessons in our schools serve as one valuable learning environment in which children experience appropriate tasks and have the opportunity to grow and develop. The unique contribution to children's physical education is in the area of movement skill acquisition.

According to Payne and Isaacs (2007), the term "movement skill" refers to a series of movements performed with accuracy and precision; a movement skill may be a fundamental motor skill (FMS) or a specialized movement skill (SMS) p.5. Gallahue and Ozmun, 2006 and also Haywood and Getchell, 2009 reiterated that in movement repertoire, fundamental motor skills (FMS) are the primary skills in which individuals aged 2-7 should gain a proficient level of competency in order to apply them for lifelong physical activities, sports and games (p.5 ; p.24 respectively). This implies that the school lessons with the instructional approaches adopted by the teacher forms the basis for exposing children to fundamental motor skills proficiency in the early stages of schooling which has the potential to intrinsically motivate children in future engagement in physical activities or sports. Clark and Metcalfe 2002, argued that children with advanced levels of fundamental motor skill proficiency are more likely to participate in physical activities and develop future habits for physical activities as also stated by Garcia and Garcia, 2008 p. 291). That is children are not miniature adults, they must be taught to be able to acquire FMS in early years.

Fundamental motor skills have been seen as the “building blocks” for lifetime physical activities (Payne & Isaacs, 2007) and as “The ABCs of movement” (Goodway & Robinson, 2006). A general misconception about FMS is that children acquire those skills naturally as a result of growth and maturation (Gallahue & Ozmun, 2006; Haywood & Getchell, 2009; Goodway & Robinson, 2006). But, children need developmentally appropriate practice opportunities, specific skill related instructions and feedbacks in order to develop. In other words, systematic motor skill instructions should be provided for children to learn and practice fundamental motor skills during the early years. The motor development literature according to Gabbard, 2007 suggests that the ideal time to teach FMS is the early childhood years (2-7 years). This implies that growth and maturation alone does not guarantee that a child will acquire FMS but when they are instructed and taught in a fascinating environment and also opportunities are given to children to practice the skill taught, they turn to learn the correct patterns of the skill.

The National Association for Sport and Physical Education (NASPE, 2009) also recognizes the importance of acquiring FMS and physical activity participation for young children. A series of national physical activity guidelines called “Active Start” have been developed for infants, toddlers and preschoolers (NASPE, 2009). Active Start includes five main guidelines for preschoolers (ages 3 to 5) suggesting that;

- a) Children should participate in 60 minutes of daily planned physical activity,
- b) Children should participate in at least 1 hour of daily unplanned physical activities,

- c) Children should gain motor skill competency which is important to engage in more complex movement tasks,
- d) Physical activity participation of children should be encouraged in safe and stimulating indoor and outdoor settings, and,
- e) The primary caregivers of children should understand the value of physical activity participation and motor skill competency for their children by providing practice opportunities for both planned and unplanned physical activities (NASPE, 2009). There is the need for children to participate always in both planned and unplanned physical activities in safe environment and this can be in the form of play or games which can be used to improve or polish these FMS in a structured programme.

Research on young children show that exposure to early instructional programmes is effective in helping children remediate developmental delays in fundamental motor skill performance and promote its development. Fundamental motor skills are common motor activities with specific observable patterns. Most skills used in sports and movement activities are advanced versions of fundamental motor skills. For example, throwing in softball and cricket, javelin throw, tennis serve and netball shoulder pass, are all advanced forms of the overarm throw.

Fundamental motor skills consist of locomotor skills such as running, jumping, skipping, hopping and galloping that move the body through space and object control skills such as catching, throwing, kicking, striking etc. These skills are commonly

considered to be the building blocks to more advanced movement skills and specific sport skills.

According to Payne & Isaacs (2007), fundamental motor skills help children control their bodies, manipulate their environment, and form complex skills and movement patterns involved in sports and other recreational activities. That is, poor performance in fundamental motor skills may jeopardize future physical activities. Fundamental motor skills should therefore be the major focus of Physical Education in the basic schools.

Payne & Isaacs (2007) emphasized that “Fundamental motor skills do not simply develop as a result of age, that is, children cannot rely solely on maturation to reach the mature stage in their fundamental movement abilities”. Environmental conditions that include opportunities for practice, encouragement, and instruction are crucial to the development of fundamental movement (Gallahue & Ozman (2002). Therefore, they must be instructed and practiced. Failure to develop and refine fundamental motor skills during the crucial preschool and basic school years often leads children to frustration that may also lead to their inability to develop specialized movements skills during adolescence and adulthood.

According to Easy and Hensley (1985), overarm throwing is one of the most important fundamental motor skills. It is a prerequisite skill that will help pupils to perform well in a game such as handball in the future. Also, Barrett (1995) and Langendorfer (1990) observed that, “Throwing involves imparting force on an external object such as a ball”. p12. During physical education lessons and other sport activities, the use of the overarm throw varies in many sport skills such as handball, spiking during



a volleyball game and throwing the javelin. In order for pupils to exhibit competency in such sport skills, they must first learn the fundamental motor skill of the overarm throw.

Belka (1994) defined traditional games as “Activities that involve at least two people who often move about in a specified area”. Traditional games are very common in Ghana and these games vary across cultures, localities and regions. These games use certain movement mechanisms that are beneficial to the learning and mastery of motor skills such as balancing, throwing, and catching.

Traditional games such as “stay”, “ole” clean your house”, are common in our Ghanaian context and can be used to develop overarm throwing skills in the kindergarten. However, despite these numerous traditional games that can be used in the teaching and development of fundamental motor skills (overarm throwing), yet these games have been forgotten in recent years as a result of modernization where playing of computer games has taken most children from engaging in outdoor and traditional games.

Considering the teaching of Physical Education in Ghanaian preschools to be precise Esau Ofori Presby Kindergarten, the researcher observed that physical education lessons that take place in the school are all unstructured. Pupils are left on their own to play whenever they go out for physical education class at the expense of teaching of fundamental motor skills or traditional games which have been well stipulated in the Kindergarten Physical Education Syllabus. An unstructured interview conducted by the researcher with one of the teachers revealed that, they don't teach any skill during physical education periods on the time table though they have the syllabus. Traditional games have been included in the Ghanaian Kindergarten Physical Education Syllabus but

as to whether they are being incorporated into teaching of some basic motor skills is yet to be confirmed.

## **1.2 Statement of the Problem**

The role of physical education in the preschool curriculum is to help pupils develop the competencies and beliefs necessary for incorporating regular physical activity into their lives. Through involvement in a well-taught physical education programme, pupils can achieve physical and personal benefits. An instruction in fundamental motor skills therefore forms an important part of every comprehensive physical education programme.

There is an emerging literature base which shows a positive effect of early motor skill programmes on motor skill development for children (McKenzie, Sallis, Broyles, Zive, Nader & Berry, 2002). Apache (2005) proposed games as “one of the best approaches for movement skill instruction”; it is the primary mode by which children learn about their bodies and movement capabilities and also a means for developing gross motor skills. However, games are not being used by teachers to teach; neither do pupils play these games in recent years due to modernization.

Pufaa (2009) stated that various researches have shown that the young West Africans are fast losing the traditional games and sports to the imported ones. He opined that it is sad to note that these traditional games and sports have now become white elephant in the curriculum of most schools in the sub region even though they can easily be performed and blended into the existing Physical Education Programme. Traditional games are games that are common in the Ghanaian society that children use in a form of

play to learn many fundamental motor skills, yet it is not being used in the teaching of basic movement skills in the basic schools; meanwhile it is stated in the physical education syllabus to be taught.

### **1.3 Purpose of the Study**

The main purpose of this study was to determine the effect of an 8-week traditional game as an instructional programme on kindergarten two pupils' overarm throwing skill development and performance.

Secondly, this study aimed at finding out the developmental level of overarm throwing skill performance of kindergarten two pupils at the pretest and posttest stages.

### **1.4 Research Questions**

The study sought to answer the following research questions:

1. What is the developmental level of kindergarten two pupils' overarm throwing skill performance at pretest and posttest stage?
2. What is the difference between the Test of Gross Motor Skills (TGMD-2 results (process measure) in overarm throw at the pretest and posttest stage?
3. What is the gender difference in overarm throw at the pretest and posttest stages?
4. What is the difference in product measure (target) of kindergarten pupils overarm throwing skill performance at the pretest and posttest stages?

### **1.5 Null Hypotheses**

The research tested the following null hypotheses:

1. There would be no significant difference in the developmental level of pupils overarm throwing skill at pretest and posttest stage.

$$H_0: \mu_{\text{pretest (developmental level)}} = \mu_{\text{posttest (developmental level)}}$$

2. There would be no significant difference in overarm throwing skill performance at pretest and posttest stage.

$$H_0: \mu_{\text{pretest}} = \mu_{\text{posttest}}$$

3. There would be no gender difference in overarm throwing skill performance at pretest and posttest stages

$$H_0: \mu_{\text{boys}} = \mu_{\text{girls}}$$

4. There would be no significant difference in product measure (target) between both groups at pretest and posttest stages.

$$H_0: \mu_{\text{pretest (target)}} = \mu_{\text{posttest (target)}}$$

### **1.6 Significance of the Study**

The researcher is of the view that this study and its findings will help teachers in the basic schools to incorporate traditional games into the teaching of other fundamental motor skills. It will help policy makers and administrators of early childhood education to identify difficulties that pupils face in their motor skills development. It will also give physical education teachers and students of Teacher Education Colleges option to different instructional approaches to teaching other fundamental motor skills apart from overarm throw.

The study can also be beneficial to physical education teachers as it provide useful information for physical educators for planning games for children in different level of motor skills learning.

More so, the researcher also believes that, this study has the potential of changing the Ghana Education Service Kindergarten Physical Education curriculum about the types of instructional activities that may be valuable in promoting the motor development and perceived motor competence of young children enrolled in all preschools in the country. Additionally, it also provides opportunities for children to participate in games via learning. Furthermore, it will also serve as a source of reference for further studies.

### **1.7 Limitations of the Study**

Limitations of the study could be listed as follows:

A child with extensive experience with throwing may demonstrate a high skill level of overarm throwing that might affect their performances beside the traditional games.

The traditional games instruction was conducted at Larteh Esau Ofori Presby KG. The results of the study may be affected by the characteristics of that school and other environmental factors.

An uncompleted building was used as the instructional site because no gymnasium or playing ground was located in the school; space limitations therefore influenced the selection of the traditional games as instructional activities.

Due to time constraint the researcher did not use a very large sample size.

### 1.8 Delimitations of the Study

Delimitations describe the populations to which generalizations will be safely made. For this study therefore the subjects were Kindergarten (KG) two pupils from Esau Ofori Presby KG in the Akuapem North District in the Eastern Region of Ghana.

The study focused on only kindergarten two pupils of Esau Ofori Presby Kindergarten in the Akuapem North District in the Eastern Region of Ghana therefore generalization of the result findings will be limited to only Esau Ofori Presby Kindergarten.

### 1.9 Operational Definition of Terms

- **ABC of movement** – basics of movement.
- **A Kindergarten pupil** – a child between the ages of 4-6years old.
- **Ole:** It is a name of a local game where children stand 3m away and throw objects into a demarcated area or empty basket.
- **Stay:** It is a name of a local game that involves children throwing a ball at their opponent. The aim of the game is to throw the ball to touch the upper body of the subjects.
- **Tennis ball-** a tool used to test pupils overarm throwing skill performance.
- **Traditional Games:** games that are played frequently by children using improvised equipment during their leisure time.

## CHAPTER TWO

### REVIEW OF RELATED LITERATURE

This chapter was broken down into the theoretical framework of the study, focusing on the dynamical systems theory and the constraints model and how they were applied to instruction as an environmental constraint on students performing the overarm throwing skill. Gender differences in fundamental motor skill development and performance was also looked at. The fundamental motor skill of overarm throwing was then focused on, including the skill's importance, how to assess the performance of the skill, and how the constraints model is applied to the overarm throwing skill. Traditional games, their importance and how to teach them was also looked at.

#### 2.1 Theoretical Framework of the Study

The dynamical system theory and the constraints model (Newell, 1986 p. 341) provided the theoretical framework for this study. According to Payne & Isaacs (2007), "Movement is a product of the cooperation of many subsystems in the body such as muscular strength, neurological status, and skeletal systems". They further emphasized that "These subsystems are frequently interacting and changing, and each movement pattern requires different subsystems that are important for the specific skill or activity". It can be deduced from the above that maturation, concise instruction and suitable environment plays a major role in the success or failure of children fundamental motor skill acquisition and improvement.

### **2.1.1 Dynamical System Theory**

The dynamical system theory explains how motor performance, such as the overarm throw can change as a result of many factors such as instruction. The dynamics of change occurring over time are influenced by a variety of critical factors within the system (such as the task, the individual, and the environment). Common patterns of movement (such as the stages of throwing) seen under specific conditions are referred to as dynamic attractors. These dynamic attractors are influenced by individual, task and environmental constraints that influence performance (Davids, Glazier, Araujo & Bartlett, 2003 p.246 Payne & Isaacs, 2007). These authorities opined that changes occur as a result of learning which is based on time and task with a reasonable success rate.

There are three primary principles of the dynamical system theory. The first is complexity. Thelen (2005) explains this principle by stating that “all human behavior and actions (mental and physical) are products of different human mental and physical parts that act on and react to each other under any combination of tasks or constraints to create a coherent pattern” p. 255. The second principle of the dynamic system theory is continuity in time. These changing states are not independent of one another, then, but are intimately bound to one another (Thelen, 2005). The third principle of the dynamical system theory is the concept of dynamic stability. According to Thelen (2005), “it is normal for dynamic systems to change from one stable mode (behavioural attractor) to the next, for when the states are stable there arise new avenues for creating new stable states”. p.256. From the authorities above it can be said that the thought processes inherent in an individual tends to be exhibited in a pattern that is built from a previous experience.



### **2.1.2 Behavioral Attractors**

During the early years, children develop a variety of common and observable motor patterns in particular situations and these are known as behavioral attractors. A behavioral attractor may be stable (always seen) or unstable (sometimes seen and sometimes not seen). A common set of behavioral attractors for young children that need to be learned in the early childhood years are fundamental motor skills (FMS). In considering the different behavioral attractors for FMS, one can go to the stage literature to understand the possible behavioral attractors (Robertson, 1978 p. 168). Each stage can be re-conceptualized as a possible behavioral attractor from which the children can select. For example, throwing has 5 possible behavioral attractors that are stage 1 (wind-up from ear level, feet stationary, no trunk rotation, & chopping action), stage 2 (entire body rotates & sling action), stage 3 (wind-up from ear level, ipsilateral arm-leg movement, little or no trunk rotation), stage 4 (wind-up from ear level, contralateral arm-leg movement, some trunk rotation), stage 5 (wind-up from leg level, contralateral arm-leg movement, body rotation from lower to upper parts). Stodden, Goodway, Langendorfer, Robertson, Rudisill, Garcia and Garcia, 2008 opined that “In order to promote physical activity, the goal for children would be to have a more extensive selection of behavioral attractors from which to choose and also more efficient behavioral attractors”. p.290.

This implies that, a larger array of behavioral attractors and more efficient behavioral attractors would allow the child to efficiently apply fundamental motor skills in games and sports across their lifespan.

### **2.1.3 The Constraints Model**

In 1984 Newell proposed a landmark model to explain how constraints operate in shifting an individual into different patterns of movement. Newell suggested that “People should be viewed as systems that are driven to perform skills in a consistent and efficient manner, as new forms of behavior arise out of old forms”.p.352 . The factors that perturb or influence old behaviors are called constraints (Newell, 1984; 1986 p.347).

Constraints are defined as “Boundaries or features that interact to limit the form of the systems searching for optimal states of organization” (Newell, 1984; 1986). The three different categories of constraints are Organismic constraints (such as balance, motivation, anxiety, and strength), environmental constraints (such as the size of the ball being used, the distance from the target, etc.), and task constraints (such as the performance demands, the movement patterns, and the degrees of freedom allowed) (Gallahue & Ozman, 2002). From Newels point of view about the constraint model it can be deduced that constraints may be personal or environmental challenges which may influence or hinder one’s performance in motor activity.

These three types are discussed in more detail below:

**2.1.3.1 Organismic Constraints** - Organismic constraints refer to the learner characteristics associated with a student’s body weight, height, and shape (Newell, 1984), which Heywood & Getchell (2005) identified as structural constraints. They are also referred to as “Functional constraints where the individual’s culture, gender, socioeconomic class, and intellectual and physical abilities influence performance”

(Ennis, 1992 p. 115). These authorities emphasize that performance is relatively proportional to a person's physique or structure.

**2.1.3.2 Environmental Constraints** - Environmental constraints include external constraints pressuring the system components that are shaping the behaviors of the dynamic system (Newell, 1984; 1986). This category may include environmental features such as the lighting in the gym, temperature, humidity, and gravity (Newell, 1984; 1986).

Environmental constraints also include the context of learning, which the teacher can manipulate in order to improve student performance. That is teaching is context specific.

**2.1.3.3 Task Constraints** – Ennis, 1992 reiterated that “Task constraints (or instructional constraints) consist of the curriculum, methods, teaching strategies, content, and material that the teachers select to use during the lessons for instruction and student learning” p. 116. Newell (1986) related three components to the task constraints:

- 1) The goal of the task that the teacher set during the lesson, which identifies the desired outcome or the product of the performance, expected;
- 2) Rules during the practice of the task, with the differentiation of opened skills and closed skills; and
- 3) Implementing the task and the student's response to the task.

Tasks constraints are also external and related to the purpose of the activity (Newell, 1984, 1986). Tasks can be defined more broadly such as throwing or catching.

However, tasks can also be defined more precisely such as throwing a tennis ball to a target 15 feet away or kicking a milk jug around a gymnasium. In this study, in order to

develop appropriate tasks, environmental and individual constraints were considered to develop meaningful tasks and to consider the interactions of the individual, environment and task. Three concepts of task constraints are specified to achieve any task: task purpose, the implicit rules, and the implementation procedures (Newell, 1984). These concepts were utilized in the design of developmentally appropriate tasks for this study.

#### **2.1.3.4 Interaction among Constraints**

Each constraint individually affects variability in movement; however, the interactions between the constraints have different impact on the individual movement (Gallahue & Ozman, 2002; Payne & Isaacs, 2007). Different individuals/Organismic constraints can affect the same task constraints differently, and at the same time a variety of task constraints might produce different outcomes from the same learner (Payne & Isaacs, 2007). For example, the ball size and target distance might lead to success for one student but difficulty for another student, and one student might have different degrees of success with the same task readiness with the same task depending on his or her body growth and inherent physical abilities. That is Constraints influence old behaviours and can be classified into three categories namely, task, Organismic and environmental constraints. These three constraints interact together to bring about variability in movement.

#### **2.2 Fundamental Motor Skills**

Motor development has been defined by Clark and Whitall (1989) as “the changes in motor behavior over the lifespan and the processes which underlie these changes”p.194. Motor development was described by Gallahue and Ozmun (2006) as

“Continuous change in motor behavior throughout the life cycle, brought about by interaction among the requirements of the movement task, the biology of the individual, and the conditions of the environment” (p.5). A recent definition of motor development by Haywood and Getchell (2009) is that “continuous, age related process of change in movement, as well as the interacting constraints (factors) in the individual, environment, and task that drive these changes”. Gallahue & Ozmun, (2002) emphasized that the “Development of these fundamental motor skills are essential for interacting and responding to environmental stimuli in both recreational and non-recreational activities and are considered basic to the motor development of children” p. 181. It can be deduced from the above that motor development is lifespan oriented being influenced by hereditary and environmental factors.

The changes that occur in motor behavior are clearly distinct in the early childhood years. The early childhood period provides a movement foundation period in which children should develop FMS (Gabbard, 2008). Fundamental motor skills are the building blocks to more advanced level of movement activities that are necessary to engage in physical activities, games and sports (Gabbard, 2008; Payne & Isaacs, 2007). Usually, children attending preschool range in age from three to six, although in Europe some differences between countries exist (Eurydice, 2002). Gallahue and Donnely, 2003 opined that “This age period is a sensitive period for the development of fundamental movement skills”.

Because most preschool children are naturally curious, love to play and explore, these FMS are learned very easily especially when stimulation, opportunities to play and to be

physically active or sport are offered. The mastery of certain FMS is a prerequisite for daily life functioning and participation in later physical or sport-specific activities.

The most common misunderstanding of FMS is that children just gain those skills as a result of their natural development. However, FMS should be taught in a developmentally appropriate way for children to gain a high level of proficiency in FMS. Object control skills include throwing, catching, striking, kicking, rolling and dribbling and are motor skills in which a child manipulates an object (e.g. ball or a bean bag) by hands, and/or feet (Gabbard, 2008; Payne & Isaacs, 2007). If these object control skills are not taught children will acquire the wrong concept for practicing these skills which consequently can affect them in the near future.

According to Goodway and Savage (2001), “Children do not naturally demonstrate a skilled performance of fundamental motor skills”.p.12. They have to learn the skills and pass through different stages of development in order to demonstrate more efficient patterns of movement before they become skilled in these patterns (Goodway & Savage, 2001 p. 13). Therefore, fundamental motor skills should be taught during early childhood and elementary school.

Fundamental motor skills are categorized into three groups listed as locomotor, non locomotor skills and object control skills (Payne & Isaacs, 2007 p. 245). Locomotor skills are motor skills that children perform to move from one point to another point in physical environment. For example, locomotor skills are walking, running, jumping, skipping, galloping and hopping (Gabbard, 2008; Payne & Isaacs, 2007). Each fundamental motor skill is composed of developmental stages, and there are processes for

moving from stage to stage (Haywood & Getchell, 2005). In order for children to learn to move from stage to stage, they need help; thus, the teacher's role is very important in children's motor development.

According to NASPE's (2004) standard 1 for physical education, it is recommended that children demonstrate competency in motor skills, specifically proficiency in movements such as throwing, so they can incorporate such skills into game situations. A NASPE benchmark for early childhood and lower primary students is that "The students should be able to demonstrate an overhand throw using mature form as well as hitting a target on a wall from a distance of 40 feet" (NASPE, 2004). Some age and gender differences among students performing the movement of throwing, however, have been demonstrated (Butterfield & Loovis., 1993 p 462 Garcia & Garcia, 2002 p. 82. ; Halverson & Robertson, 1979 p. 259; Langendorfer & Robertson, 2002 p.17).

### **2.2.1 The Importance of Fundamental Motor Skills**

Fundamental motor skills is one of the most essential assessment in the physical education setting that provide a wide base of movement abilities from which more advanced skills can be developed. A child whose fundamental motor skills are not amply developed will not have a foundation upon which to build proficient movement forms.

The standard says that "Physically educated person can apply movement concepts and principles to the development of additional motor skills". (Williams, 2003 p.4) This implies that the principles of movement obtained when developing fundamental motor skills continue to be useful and demonstrates the critical need for elementary school physical educators to teach the fundamental motor skills. Helping students master these

skills in their early years will help ensure that they learn to enjoy and appreciate a lifetime of movement.

Colvin, Markos, and Walker (2003) point out that “A physical educator must do more than just provide enjoyable activity for the elementary student”. The activity must be purposeful. In order to achieve this at the elementary school level, the physical educator's program must center on mastering fundamental movement skills and learning developmentally appropriate physical activity concepts. As Colvin et al. further stressed that, children are able to master the fundamental motor skills with greater ease during their elementary years than at any other point in their life. If children miss this opportunity to develop motor skill proficiency, they will likely be hampered from enjoying recreational and sport activities later in their life (Williams, 2003).

Fundamental motor skills do not naturally emerge as mature patterns of movement rather they must be taught and practiced (Gabbard, 2000). Physical educators and teachers in the lower primary have a tendency to assume that by the age of eight or nine years these basic movement patterns will simply be acquired and mastered through the normal developmental process. While it is true that some fundamental motor skills (such as walking) will naturally develop to an acceptable level of proficiency for most children through the development process, the majority of fundamental motor skills must be taught, reinforced, and assessed to ensure that all children have the skills needed for later movement success.

Fundamental motor skill development is crucial in the overall development of the child (Gallahue, 1987). Motor development involves changes in motor behaviour



throughout the lifespan, as well as the processes responsible for these changes (Clark, 1994; Ulrich, 2000). McKenzie, Alcaraz and Sallis., 1998 emphasize that “Children who develop motor skills at an early age grow in confidence and are likely to participate in youth sports and physical activity” (p.327). On the other hand, children who develop poor Fundamental Motor Skills may not be motivated to participate in sport and games due to their lack of the basic skills (Seefeldt, 1982). Their incompetence may cause them to abandon or reject sports, and this may lead to an inactive lifestyle (McKenzie, Alcaraz and Sallis., 1998). Early childhood and the early school years have been identified as the time frame that FMS emerge and evolve (Ulrich, 2000). Seefeldt (1987) suggested that children must develop FMS to a certain proficiency level to be able to perform more complex movement skills. Developing skills and proficiency in FMS could lead to physical, social, and emotional benefits and may result in a more active and healthy lifestyle (McKenzie, Alcaraz and Sallis., 1998). Guidelines of the National Association of Physical Education (NASPE) suggest that preschoolers should develop competence in movement skills that are building blocks for more complex tasks (NASPE, 2002).

The school environment is where children learn FMS, and physical education programs provide opportunity for children to practice and develop motor skills (Graham, Holt/Hale, & Parker, 2005). It is therefore important that early and effective instructional strategies are used to develop and correct movement patterns so that children can acquire advanced movements used in sport and their everyday physical activities. It is also clear that children and adults who are physically active on a regular basis are healthier than those who are not active. It is also evident from research findings that “Many children

and adults do not regularly take part in physical activities that contribute to a healthy lifestyle” (Sanders, 2002).

Developmentally appropriate practice suggests that we as adults make educational decisions based on what is known from research and experience about how children learn and develop. For example, learning to strike a ball with a bat is not an easy task especially when we use a regulation baseball and a wooden bat. Using a plastic ball and bat is more developmentally appropriate and will initially better help the child learn the skill.

### **2.2.2 Fundamental Motor Skill Instructional Programmes**

Fundamental motor skills (FMS) are essentials for children to engage in lifelong physical activities, sports and games (Haywood & Getchell, 2009; Payne & Isaacs, 2007). Research shows that, children who demonstrate developmental delays in FMS who receive well designed motor skill instruction, have demonstrated significant improvement in FMS (Goodway & Branta, 2003 p.44; Goodway, Crowe & Ward, 2003.p 313, Robinson & Goodway, 2009 p. 422). In addition, motor skill instruction has been found to bring about a more realistic match between actual motor competence and perceived motor competence (Goodway & Rudisill, 1996).

A variety of instructional techniques have been documented to deliver motor skill for children in early childhood. Direct instruction (Goodway, Crowe & Ward, 2003., Goodway & Branta, 2003) and mastery motivational climate (Robinson and Goodway, 2009; Valentini & Rudisill, 2004a) are the most common techniques used in various motor skill instructional programmes. Direct instruction has a long history in research on

teaching and reported as the most effective way to teach (Becker & Carnine, 1981 p.427). In this approach, a structured instruction is delivered to the children by a very clear format and students do not have any choices or preferences to select a task or activity (Graham, Holt/Hale and Parker, 2007). The instructor controls each element of the lesson during instruction and students follow the directions and complete the task in a given format (Graham et al., 2007).

Savage (2002) also investigated the effect of an eight-week motor skill programme on the motor skill development of pre-school and kindergarten children. The experimental group was 36 and the comparison group was 47. Both groups demonstrated developmental delays in object control skills at pretest. The posttest data indicated that there was improvement in object control skills. Savage, however, reported gender differences in the pretest object control scores, with boys scoring higher than girls. But these differences were not found in the posttest score.

However, effective motor skill programmes share similar characteristics in terms of methodological issues. It is well documented that an effective motor skill instruction should have duration of around 8 to 12 weeks meeting two days per week. Typically, 16 to 24 instructional sessions should be arranged to deliver the programme and each session should take 30 to 45 minutes. This implies that an effective motor skill instructional programme can be said to have an effect on fundamental motor skill acquisition and development in young children during early years of schooling.

#### **2.2.4 Measurement of Fundamental Motor Skills**

A number of FMS tests have been used in previous research investigating the relationship between Fundamental Motor Skills and Physical Activity. The lack of validity and of a comprehensive approach to the FMS compromises most of the research studies. Furthermore, motor behavior specialists suggest that FMS should be evaluated with the use of process-oriented rather than product-oriented assessment techniques.

Non validated FMS tests have compromised the internal validity of some research studies (McKenzie, Sallis, Broyles, Zive, Nader & Berry., 2002 p.238). Other tests were valid but not representative of the entire gross motor skill development due to the use of limited number of movement skills (Fisher, Reilly, Kelly, Montgomery, Williamson & Paton., 2005 p. 684; Okely, Booth and Chey., 2004 p. 238). The exception to the rule is the research study by Wrotniak, Epstein, Dorn, Jones and Kondilis. (2006). Wrotniak and colleagues (2006) assessed children's motor abilities with a valid and comprehensive test of balance, gross, and fine motor skills with the Bruininks-Oseretsky test of motor proficiency. The problem with this instrument is that it utilizes a product-oriented assessment technique. Recent trends to assess movement skills have been using process-oriented measures.

Product-oriented assessment techniques evaluate the outcome of the movement skills, while process-oriented assessment techniques evaluate the form of the movement skills. For example, when testing an overhand throw, product-oriented tests report the distance and/or accuracy of the throw, while the process-oriented tests report whether the form of the movement skill incorporates the item criteria observed in a mature pattern.

Process-oriented assessments of FMS must be used rather than product-oriented assessments because they more accurately identify specific characteristics of the movement, reflecting the developmental skill level instead of physical growth and maturational levels of children. FMS measure instruments must also include a large number of representative movement skills in different subsets to account for the different aspects of gross motor skill development. Holistic FMS assessments incorporate locomotor, manipulative and stability skills.

However, not all subsets are necessary for all age groups. A developmentally appropriate FMS test for children ages 6- to 10-years must include a combination of locomotor and manipulative skills (Gallahue & Ozmun, 2002). Stability skill testing, which measures balance skills, is not required because the onset of these skills occurs very early in development; thus, a ceiling effect may be observed with 6- to 10-years-old children.

To be meaningful, a test has to incorporate skills closely related to activities and sports in which children are most likely to participate. The locomotor and the manipulative skills are first mastered separately by the child and later gradually combined and enhanced in a variety of ways to become sport skills. The selection of an appropriate test requires clinical observation on the purpose of the assessment and children's characteristics (Wiat & Darrah, 2001 p. 282). For the purpose of this research study, the Test of Gross Motor Development (TGMD-2) was used as the test of gross motor skills (overarm throw skill) for kindergarten two children.

The Fundamental Motor Skills Assessment was developed primarily to provide information to the teacher that will assist in the process of teaching and learning. Teachers can use the Fundamental Motor Skills Assessment to evaluate the performance of their students' skills that have been identified as critical for all children to learn. Within each skill, the teacher will be able to identify the specific component(s) about which the teaching should be organized.

Fundamental motor skills are believed to develop in developmental sequences (Robertson, 1978 p. 162). Two approaches have been identified for the development of FMS. This is the total body approach where movement involves the use of the entire body unit to perform a skill as a single stage (Haubensticker, Branta, & Seefeldt, 1983) and the component approach which suggests that there are stages of development within the different body components that produce the movement (Robertson, & Halverson, 1984).

Another researcher by name Ulrich in the year 2000 identified a different approach for measuring FMS. This approach identified the elements of how body parts are coordinated during the performance of the skill rather than assessing the end of the performance. For instance, Ulrich (2000) identified the following criterion element for measuring overarm throwing skill performance;

- (1) Windup is initiated with downward movement of hand/arm,
- (2) Rotation hips and shoulders to a point where the non throwing side faces the wall,
- (3) Weight is transferred by stepping with the foot opposite the throwing hand, and

(4) Follow-through beyond ball release diagonally across the body toward the non preferred side (Ulrich, 2000). These fundamental motor skills were assessed by Ulrich using the Test of Gross Motor Development instrument which was designed by Ulrich first in the year 1985 and the second edition in the year 2000.

### **2.3 The Test of Gross Motor Development-2 (TGMD-2, Ulrich, 2000)**

The Test of Gross Motor Development (TGMD, 1985) is a valid and reliable process-oriented fundamental movement skill test that was recently revised (Ulrich, 2000). The purpose of the TGMD-2 is to measure the gross motor development of children from 3 years, 0 months to 10 years, 11 months of age. Among the primary goals of the TGMD-2 is to serve as a measurement instrument in research involving gross motor development. The TGMD-2 measures how children coordinate their trunk and limbs during the performance of a task rather than assessing the end results such as how fast children run or how far they throw.

According to Ulrich (2000), TGMD-2 was made up of two subtests, locomotor and objects control. In the locomotor subtest, it included six gross motor skills (Run, Gallop, Hop, Leap, Horizontal Jump, and Slide) that require fluid coordinated movements of body of children as they moved in one or another direction. Aside of the locomotor skills, object control subtest also included six gross motor skills (Striking a Stationary Ball, Stationary Dribble, Catch, Kick, Overarm Throw, and Underhand Roll). The selected test items on TGMD-2, represents the most common skills children acquire during preschool and early elementary school years (Ulrich, 2000). When the performance is correct a score of 1 is marked, incorrect performances are scored 0. The

sum of both performances represents the final score for each item. Standard scores for both locomotion and object control parts can be calculated and age equivalents can be derived. The test is administered in 15 to 20 minutes and requires equipment that is commonly used during PE. The test revision shows several improvements. Ulrich (2000) reports on reliability and validity issues which have been thoroughly revised: internal consistency and stability coefficients have been added and reliability coefficients have been computed for subgroups of the normative sample, validity for a wide variety of subgroups has been obtained.

The TGMD-2 designed by Ulrich in the year 2000 can be said to be a standardized instrument used in assessing specific strengths and skill difficulties in motor skill. It is use to measure the process outcome of fundamental motor skills. The measures obtained on skills can help teachers design developmentally appropriate instructional programs for children or individual pupils based on their performance outcome in school.

#### **2.4 Motor Skill Performance of Young Children**

Motor development is a fundamental component for young children to produce an effective and fluent action. In order to assess motor skills performance of young children in an efficiency way, a reliable tool is needed. More than that, Fliers, Vermeulen, Rijdsijk and Altink (2009), suggested that “Poor motor performance; does a motor skills-related program effectively help with the improvement of motor skills ability”? p.25. The answer was showed in the study of Heather (2002). She investigated the effect of an 8-week motor skill instruction among children. From the investigation, she discovered that the motor skills ability especially on the object control skills could be significantly



improved after the 8-week motor skill instructional programme. While Lee and Zhu (2005 p.116) indicated that object control was the most difficult category in TGMD-2, the previous studies showed that it could be effectively improved through motor skills instructional programmes.

What's more, similar result was found in the study of Goodway and Branta. They examined the influence of a 12-week motor skill instruction on motor skill development of children, the result reflected that it is useful to provide motor skills-related programme for improving children's motor skills. Moreover, a well-organized programme schedule was needed, and it was better to have experienced instructors and provide appropriate equipments within the programme.

In summary, motor skill instructional programme had been found to have a significant effect on motor skill acquisition and development in children between 0-10years.

## **2.5 Gender Differences in Motor Skill Development**

Gender difference is another aspect of motor skill development of children. Numerous studies have investigated gender differences in motor skills (Haunbenstricker, Branta & Seefeldt, 1983; Hall & Lee 1984; Garcia & Garcia, 2002; Junaid & Fellowes, 2006; Lorson & Goodway, 2008; Thomas & French, 1985). Most of these studies revealed gender differences in object control skills in favour of boys (Garcia & Garcia, 2002; Lorson, & Goodway, 2008; Thomas & French, 1985; Nelson, Thomas, & Nelson, 1991) among many studies that made efforts in establishing gender difference in motor skill development. In particular, considerable research had focused on throwing because it is a common sport skill in many sports, games and activities.

A meta-analysis was conducted by Thomas and French (1985 p. 260) to examine possible causes of gender differences in motor skill development. Biology, environment and their interaction effects on the motor skill development were analyzed among 63 studies including 31444 subjects and yielding 702 effect sizes. Gender differences in catch, balance, shuttle run and vertical jump were found as mostly related to environment prior to the puberty. However, throwing performance in boys and girls was more biological reported in 21 studies examining accuracy (5 studies), velocity (5 studies), and distance (11 studies). Effect sizes were 2.18 for throwing velocity and 1.98 for throwing distance. It was reported that boys had better scores than girls in terms of throwing velocity around 4 to 7 years old and throwing distance around 2 to 4 years old (Thomas & French, 1985). The findings of this meta-analysis aligned with an earlier research, which examined the changes in throwing performance of 100 kindergarten children (48 girls and 52 boys) over 3 years (Nelson, Thomas and Nelson., 1991 p. 105-108). The researchers reported that boys were more proficient in their throwing performance including throwing distance, differentiated rotation and taking opposite step.

Gender differences in throwing have been also seen for different age groups. An international comparative study examining throwing in Germany and United States reported that throwing velocities of boys were higher than the girls in both countries and German girls (M age=14) failed to show humerus, forearm and backswing action (Robertson, & Langendorfer, 2005). Robertson and Konczak (2001) also reported gender differences in developmental sequences of throwing among 13 years old girls. Their developmental level was found as low for throwing p.91-103. Recently, Lorson and Goodway (2008) found consistent findings with regard to gender differences in throwing

for 124 first and second graders. Gender differences were seen at pretest for the throwing components of step, trunk and forearm in favour of boys (Lorson & Goodway, 2008 p. 174-182).

Overall, those gender differences were explained by biological and environmental factors or constraints in these studies. Arm muscle, leg muscle and shoulder hip ratio were associated with the throwing performance (Nelson et al., 1991). As an environmental factor, an existence of a male at home was positively associated with girls' throwing performance (Nelson et al., 1991). In addition to this, Garcia and Garcia (2002) claimed that high quality instruction including encouragement, motivation, and modeling were effective for girls and the number of practice trials should be increased for better performances among the children. Socio-cultural factors (e.g. different expectations from children) may also play a role in emerging gender differences in fundamental motor skills (Lorson & Goodway, 2008).

Another explanation in gender differences might be children's interactions in the engagement of fundamental motor skills (Garcia, 1994). A qualitative research study conducted by Garcia (1994) examined 34 preschool children to show how children interact with each other while learning fundamental motor skills. Boys were competitive, individualized and egocentric. On the other hand, girls demonstrated cooperative, caring, and sharing behaviors. Social aspect of learning environment might have some effects on the motor skill development of children, that's why, the interactions of children should be taken into consideration while teaching fundamental motor skills and organizing early instructional programmes for children (Garcia, 1994). That is Gender differences exist in motor skill performance with boys recording high improvement than girls.

## **2.6 Fundamental Motor Skills and Overarm Throwing**

Fundamental motor skills help children control their bodies, manipulate their environment, and form complex skills and movement patterns involved in sports and other recreational activities (Goodway and Savage, 2001; Graham, Holt/Hale & Parker, 2004). The National Association for Sport and Physical Education (NASPE, 2004) has recommended that children need to demonstrate competency in motor skills, specifically developing skill and proficiency in basic movements such as throwing so they can apply them in game situations. Overarm throwing is a critical fundamental motor skill that is an object control skill. It is one of the most important skills in physical education due to its extensive use in a variety of sports (Butterfield & Loovis, 1993).

Teaching the throw in the elementary years will give students the capacity for successful and advanced levels of performance (NASPE, 2004), which may increase the likelihood of their participation in games and recreational sports that utilize throwing as a foundational skill. Overarm throwing has been studied by many researchers using both a product and process approach to throwing (Garcia & Garcia, 2002; Langendorfer & Robertson, 2002a; Robertson & Konczak, 2001; Thomas & French, 1985).

One approach to examining how throwing develops is the component approach to throwing (Robertson, 1977). This approach suggests that children progress through a series of developmental levels in each of five different body components: step, trunk, backswing, humerus, and forearm (Robertson, 1977). That is, early attempts at throwing are immature and primitive, but with instruction and practice, children develop

increasingly more efficient patterns of the movement (Goodway & Savage, 2001; Halverson & Robertson, 1979).

### **2.6.1 The Importance of Throwing**

Overarm throwing is one of the most important fundamental motor skills (Butterfield & Loovis, 1993; Easy & Hensley, 1985). Throwing involves imparting force on an external object such as a ball (Barrett, 1995 p.66; Langendorfer, 1990). During physical education lessons and other sport activities, the use of the overarm throw varies in many sport skills such as executing the badminton clear pass, spiking during a volleyball game, and pitching a baseball (Butterfield & Loovis, 1993). In order for students to exhibit competency in such sport skills, they must first learn the fundamental motor skill of the overarm throw. Developing a mature pattern of the skill with progressions will enhance the involvement of the participants in more advanced skills and may increase the probability of them becoming lifelong physically active citizens (NASPE, 2004).

### **2.6.2 Factors that Influences Overarm Throwing Skills**

Several factors had been identified by researchers to have influence children's performance in overarm throwing skills. Payne and Isaacs identified five major factors that influence throwing performance namely; instruction, knowledge, instructional cues, ball size and angle of release but for the sake of this only instruction, knowledge and instructional cues will be looked at.

### **2.6.2.1 Instruction**

Amui, (2006), investigated the effect of two instructional approaches on object control skills of children considered disadvantaged and found out that both direct instruction and mastery motivational climate significantly improved object control skill performance of participants from pre-to-post-intervention. Halverson and Robertson (1979) also administered a movement program that included 120 minutes of guided practice in overarm throwing to 24 kindergarten students. They measured developmental changes in movement components instead of developmental changes in ball throwing velocity. An analysis of the data indicated that instruction significantly influenced throwing technique.

### **2.6.2.2 Knowledge**

Declarative knowledge appears to be an important factor affecting the overarm throwing performance of young children. Using the object control subtest of the TGMD, Schincariol (1995) found out that significant difference exist for questions relating to ball size stepping forward with the opposite foot, and throwing low.

### **2.6.2.3 Instructional cue**

Knowledge of throwing is said to influence throwing performance. This stands to reason that the identification of critical cues regarding the act of throwing should facilitate both product and process oriented performance. Fronske, Blakemore and Abendroth-Smith (1997) examined the use of multiple action cues on the overarm throwing performance of third through 5<sup>th</sup> grade student. The researchers conclude that the group receiving verbal cues showed significant improvement in both process and

product variables. Based on this finding the authors suggested that “teaching skill techniques using proper cues should be impressed upon pre-service teachers as well as experienced practitioners” Fronske et al, 1997 p.93).

### **2.6.3 Assessment of Overarm Throwing Performance**

Overarm throwing is considered one of the most complex fundamental motor skills. Payne and Isaacs (2007) claimed that the overarm throw can be divided into three phases:

- (1) The preparation phase, which consists of all the movements directed away from the intended line of projection;
- (2) The execution phase, which consists of all movements performed in the direction of the throw; and
- (3) The follow-through phase which consists of all the movements performed following the release of the projectile (p. 342).

#### **2.6.3.1 Process Measure of Throwing**

The process measures of throwing describe the movement of the body components during the execution of throwing. Body components vary across time in a nonlinear relationship with product measures such as velocity and accuracy (Halverson & Robertson, 1979). “Developmental sequences,” according to Robertson and Konczak (2001), are “Verbal descriptions of the qualitative changes that occur in the way the individuals use their bodies as they perform the same motor task over time” (p. 92). Leg drive and opposition is the critical feature that combines the thrower's stance and step

into the throw, setting up the later rotations of the body to provide a great deal of the power for the throw. Opposition is created by turning the non-throwing side of the body to the target. Leg drive or weight transfer occurs when the thrower pushes off the back leg and steps toward the target with the opposite foot. The forward step of mature high-speed throwers is usually greater than 50 percent of standing height (Robertson & Halverson, 1984). The changes that occur during the movement are more challenging to describe and are more challenging to obtain with comparison to the product measures (Robertson & Konczak, 2001). Knowing the changes that occur during movement and being able to identify the different body components that are related to the movement might help the physical education teacher improve student performance (Robertson & Konczak, 2001).

Developmental sequences of the overarm throw have been developed from two perspectives; the total body approach (Wild, 1938), and the component approach (Robertson, 1977, 1978).

### **2.6.3.2 The Total Body Approach to Overarm Throwing**

Almost seventy years ago, the first study of developmental throwing stages was conducted by Wild (1938), who observed 32 boys and girls (Payne & Isaacs, 2007). As a result of this research, Wild (1938) identified four developmental overarm throwing stages. According to Wild's (1938) findings, moving from one stage to the next stage over time proceeds in linear fashion and order (Garcia & Garcia, 2002). "Linearity in a sequence of throwing refers to a hierarchical progress in the sequence without regression to immature forms (invariant order)," stated Garcia & Garcia (2002, p. 63). Furthermore,



progression to a more mature pattern of the throw could be changed in the sequence but only to the closest stages (Garcia & Garcia, 2002).

The first stage; stage 1, described a performance involving stationary feet and a dominant arm movement with no trunk rotation. In contrast, the most mature stage, stage 4, showed a mature pattern of throwing with a contralateral step, trunk rotation, and the arm horizontally adducted in the forward swing. Forty-five years after Wild's (1938) research, Haubenstricker, Branta, and Seefeldt (1983) developed a five-stage throwing sequence referred to as the total body approach. The total body approach depicted a stage 1 that was very similar to Wild's, with no step or trunk rotation and a chopping arm motion. The distinctive feature of stage two was horizontal wind up, the performer may step forward with either an Ipsilateral or contralateral pattern, but the arm is brought forward in a transverse plane and the motion resemble a sling shot rather than a throw due to the extended arm position during the throw. By stage 3, children were stepping ipsilaterally (same foot, same arm) with little or no rotation of the spine and the hips in preparation for the throw. Stage 4 is characterized by contralateral step with high wind up, little spinal rotation and follow through across body and by stage 5 (the most mature stage), children stepped with opposition, had segmental trunk rotation, and showed arm wind-up and follow through. The total body approach was developed under developmental stage theory, which suggested a linear sequence of development that was universal and had an intransitive order (Haubenstricker, Branta, & Seefeldt, 1983).

Garcia and Garcia (2002) analyzed 3469 throws of six children aged two to five years over a 2 year period using the total body approach but dynamic systems theory as the theoretical framework. Within the dynamic systems framework, the

prescriptive nature of stages was re-conceptualized as being behavioral attractors. Garcia and Garcia (2002) indicated that children's developmental throwing patterns were nonlinear and varied as a result of individual constraints as well as environmental constraints such as the learning context and the motivation of the child, thus supporting the dynamic systems theory as an appropriate theoretical framework within which to analyze throwing development (Garcia & Garcia, 2002). The underlying assumption to this approach is that development occurs in a linear fashion and is directed toward an endpoint that is defined by a mature pattern of throwing (Robertson, 1978).

Secondly, the observable characteristics of children appear seemingly at different developmental levels. However, one difficult fundamental problem with this approach has to do with how the organism moves from one stage of throwing to another which is inadequately answered (Newell, 1986).

#### **2.6.4 Constraints Model and Throwing**

The component approach to throwing accepts that the developmental levels of motor skill components reflect underlying "attractors" in the dynamic system (Langendorfer & Robertson, 2002). Attractors are considered strong if developmental levels are stable across trials, are qualitatively different from each other, and are presumed to transition to other forms at times to increased intra-individual variability (Payne & Isaacs, 2007; Haywood & Getchell, 2005). A change in the qualitative state of a child's throw is evidence for a change in constraint. Langendorfer and Robertson's (2002) study supported Newell's (1984, 1986) constraints model in that it was found that

the movement patterns used to throw a ball emerge from various relationships that constrain the action.

#### **2.6.4.1 Organismic Constraints and Throwing**

Age and gender are two variables that have been studied as important factors that influence overarm throwing development (Butterfield & Loovis, 1993). Gender differences in favour of boys were found both in process measures such as the form of the throw (Butterfield & Loovis, 1993; Garcia & Garcia, 2002; Halverson & Robertson, 1979); Thomas, Michael, and Gallagher (1994) examined the impact of different training on overarm throwing for distance. They conducted a Meta -analysis to studies related to throwing for distance with students in the age range of 5–9 years (N=426). The findings from pre-to posttest indicated that both boys and girls improved relative to their pretest, but the gender and training interaction did not have a significant influence on the gender differences that remained significant. The girls did not “catch up” with the boys, who also improved their performance from pretest to posttest (Thomas, Michael, & Gallagher, 1994). Overall, the findings relative to gender and age indicated that boys perform better than girls in all categories of throwing, including process and product measures (Butterfield & Loovis, 1993; Garcia & Garcia, 2002; Halverson & Robertson, 1979).

#### **2.6.4.2 Task Constraints and Throwing**

Task constraints include the external constraints that focus on the goal of the activity that the teacher assigns to the students during the lesson (Barrett & Burton, 2002; Langendorfer, 1990). Different tasks during the physical education lesson can produce different performance of the overarm throw. If the child stands far from the target and

needs to use force to hit the target, the throwing performance will be different than the throwing pattern he/she might use to hit a close target. When the task constraints change, the performance of the throw also changes. Langendorfer (1990) examined the development of throwing patterns when changing the task from accuracy to force. The participants (43 fourth graders aged nine and ten years) improved their performance when they were asked to throw harder. A significant difference was identified in the throwing components under the force conditions (Langendorfer, 1990). Most of the participants used a less mature pattern when throwing for accuracy than when throwing for force. William, Haywood, and VanSant (1993 p.2-12) found that males performed at higher developmental levels than females and also threw faster when asked for forceful throws rather than for accuracy. These findings clearly demonstrate the importance of the task demand and its effect on the developmental level of the overarm throw. Physical education teachers need to be aware of how and when to change the task demand as well as know their students' skill levels to match their abilities (Barrett, 1983 p.9).

#### **2.6.4.3 Environmental Constraints and Throwing**

Common environmental features studied include the size, weight, and mass of the ball, as well as the distance from the target and the amount of feedback delivered by the teacher. However, little research has examined the effect of different instructional strategies and methods on the developmental levels of students' overarm throwing (Browning and Schack, 1990; Oslin, Stroot & Siedentop, 1997., Stodden, 2002). Dusenberry (1954) investigated 56 students aged three to seven years to determine their throwing performance for distance. One group received specific throwing instructions twice a week for three weeks, while the other group of students served as a comparison

group and only practiced the throw without instruction. The results from this study clearly showed an advantage for the boys in arm and hand movement of the throw. It was also indicated that even though both groups improved during the five weeks of practice, the group of students who received specific instructions had higher throwing scores for distance in comparison to the other group (Dusenberry, 1954 p. 13).

Moore, Reeve, and Pissanos (1981) studied the effect of different instruction on overarm throwing performance among children. The primary purpose of their study was to determine whether different instruction influenced the distance and accuracy of the throwing performance (Moore, Reeve, & Pissanos, 1981 p.779). One hundred and seven students (m=58, f=49) were divided into three instructional groups; two groups received instruction related to the overarm throw and the third group did not receive any throwing instruction. The students were pre- and post-tested on throwing beanbags for distance and accuracy. The results of this study indicated significant differences with advantage to the boys for both measures. No significant differences were found between the two instructional approaches (Moore, Reeve, & Pissanos, 1981). In both studies, differences between the performance of the boys and girls were found, as expected (Moore, Reeve, & Pissanos, 1981).

Lorson (2003) followed Stodden's (2002) line of research and investigated first and second grade students performing overarm throwing for force. The students (N=124) were divided into three different instructional approaches. One group received critical cues during instruction, the second group received a typical physical education approach, and the third group received biomechanical instruction. The results from the study indicated that students in the biomechanical instructional approach showed that students

in the biomechanical instructional approach showed better improvement in the humerus and forearm components in comparison to the other two instructional approaches. Even through the three instructional approaches improved the throwing performance of all the children involved, the biomechanical approach had an advantage on the more advanced levels within the components (Lorson, 2003).

## **2.7 Traditional Games**

Hastie and Martin (2006) defined a game as “A rule driven pastime involving physical activity that entails cooperation as well as competition against others or oneself” p. 332. A game is a complex movement that demands quality teaching if the children are to become skilled and knowledgeable. One must be able to analyze the intricacies of strategy as well as help children acquire efficient movement patterns. Apache (2005), proposed games as one of the best approaches for movement skill instruction; it is the primary mode by which children learn about their bodies and movement capabilities and also a means for developing gross motor skills.

According to Gallahue (1993), games are important instructional tool of the Physical education programme. Games therefore describes activities that can be created by both teachers and children that are easy to play, have few and simple rules, require little or no equipment and can be varied across cultures and localities. It behooves on teachers to develop and use variety of local games when teaching if their ultimate goal is to improve the fundamental movement skills of kindergarten and early childhood pupils. The inclusion of games in the physical education lesson generally begins during the early

childhood and primary school years. Games are mostly used by the astute teacher as an educational instructional tool for skill development and improvement.

Pufaa (2009) opined that various researches have shown that the young West African youths are fast losing the traditional games and sports to the imported ones. He opined that it is sad to note that these traditional games and sports are now adamant in the curriculum of most schools in the sub region even though they can easily be performed and blended into the existing Physical Education programme. There is the need for teachers to instruct and create an environment that will give children opportunity to practice these games.

### **2.7.1 Types of Traditional Games**

Traditional games differ across country, culture, society and religion. Gallahue classified games into the following categories

- i. Low level type games
- ii. Relay games
- iii. Lead up games
- iv. Official sports and
- v. Cooperative games

### **2.7.2 Importance of Games**

The developmental approach to teaching children's Physical Education view games primarily as "A tool for applying, reinforcing and implementing a variety of fundamental movement skills and sports skill" (Gallahue, 1993, Pg 212). Games are not

viewed as a primary means of learning new movement skills but rather serve as a primary means for improving, applying and utilizing present skill level. Gallahue (1993) went on to say that “Games are fun, which adds a direction of group interaction to the lesson and may be used to promote movement skill development”. Pufaa (2009), reiterated that “Traditional games and sports promotes physical development such as strength, speed, coordination, flexibility, agility and endurance which tend to also improve upon the mental capacity of the performer” p.157.

### **2.7.3 Objectives of Games in our Lessons**

1. Movement Skill Development- to enhance FMS (basically stability, locomotor and manipulative skills)
2. Fitness Enhancement- to promote improved health related physical fitness and also to promote motor performance.
3. Affective Development- to promote interaction with others and also to develop positive self growth such as self confidence and self esteem.
4. Cognitive Development-to promote perceptual motor learning (body spatial directional and temporal awareness and also promote learning readiness skill such as listening and following instructions.

Gallahue (1993) identified the following instructional practices which need to be considered and adopted when selecting a game and presenting games to pupils.

- a. Choose games that are common to the pupils.
- b. Choose games that are appropriate to the time, space, class size, available equipment and specific objectives of the lesson.



- c. Plan in advance, think through the games and have lines drawn, equipment ready and other pre-planning procedures completed.
- d. Explanation should be clear and, brief and concise.
- e. Combine explanation with demonstration.
- f. Correct outstanding faults but avoid fine details in the beginning in order to get game going.
- g. Avoid stopping the game frequently to make correction.
- h. Make suggestion in a positive way.
- i. Show interest by taking part.

#### **2.7.4 Factors to Consider when Selecting the Appropriate Games for Children**

To select developmentally appropriate games for inclusion in Physical Education lessons, the following processes are recommended by Gallahue (1993);

1. Determine the specific objectives of your lesson and select games in the locality that will suit the particular skill you want pupils to improve upon and that will help you satisfy these objectives.
2. Determine the ability level of your pupils in terms of skills, comprehension and interest. Knowing your pupils abilities is the easiest way to determine which games should be selected or changed.
3. Modify the game to fit the specific objectives of the lesson and the ability of the class and the movement skills used.

### 2.7.5 Teaching of Games

According to Wall, (1990), a variety of skills are needed to teach games. Games are often taught in large spaces. In teaching games the right terminology should be used, establish a system of signals for start and stop. A considerable amount of equipment is often required for games lessons.

**The use of space:** thus when lessons are outside it is necessary to establish boundaries.

**Grouping:** the teachers need to employ a variety of ways to group the children during the lesson, especially for task where the children perceive scores to be important. Once pupils form their groups do not split them.

**Observational skills:** watch the pupil's feet and give them plenty of refinement directed toward improving footwork. Begin to encourage "moving feet" your kindergarten children and continue to stress its importance at all levels of performance.

**Participation:** participating in children's game is a useful and enjoyable teaching technique. Adapt to the skill level of pupils. Being part of it makes you act as a catalyst not to demonstrate prowess.

**Scoring:** The score is an important part of any game it is the used to determine how well one's performance is for the activity.

### 2.8 Games Participation among Children

Over the last decade there has been a building body of evidence that "An active lifestyle is one of the best investments for individual and community health" (Bauman, Bellew, Vita, Brown & Owen, 2002). Engaging in regular physical activity, even of

moderate intensity, reduces the risk of diseases such as cardiovascular disease, osteoporosis, obesity and injury. Regular physical activity facilitates better stress management, alleviates depression and anxiety, strengthens self esteem and provides social benefits through increased social interaction and integration (Bauman et al., 2002). With regards to children and adolescents, physical activity is also related to the optimal functioning of various physical, psychological, and social processes. Previous research reports that participation and involvement in physical activity and games during childhood and adolescence may contribute to a continuing commitment to a physically active lifestyle in adulthood. However, children are being exposed to a growing range of sedentary recreation opportunities, such as the internet, television, videos and computer games, homework and additional tutoring. Children are becoming less active as they become older, and participation and activity levels are lower in female children (Troost, Pate, Freedson, Sallis & Taylor, 2000 p.426; Hands & Martin, 2004 p.49).

In a recent national survey on Australian children, more than 4,000 males and females 5 to 16 years old wore pedometers for up to seven consecutive days and completed a computerized 24-hour physical activity recall (Commonwealth Department of Health and Ageing, 2007). It was found 5- to 8-year old boys averaged 13,815 steps per day, and girls averaged 12,086 steps per day. Overall, 55 % of boys and 66% of girls met the recommended steps per day. Stodden, Goodway, Lagendorfer, Roberton, Rudisill, Garcia and Garcia (2008) conceptualized the underlying determinants of physical activity in children in a different manner to Welk (1999). They proposed that “The development of actual motor competence is the primary underlying mechanism that promotes engagement in physical activity” p.305.

## 2.9 Summary

In summary, nowadays, people are getting higher concern about young children's motor development. With no doubt, this is an essential foundation of children's growth. In order to acquire the motor skills ability of children accurately, the second edition of Test of Gross Motor Development (TGMD-2) was the best implement. There were totally two subtests among TGMD-2, which were locomotor subtest and object control subtest. Locomotor skill required fluid coordinated movements of body of children as they moved in one or another direction, while object control skills were demonstrated by effective throwing, catching, and striking movements. Six gross motor skills included in each component. Besides, researchers found out that motor skills ability and performance was highly related to instruction, and engaging in developmentally appropriate physical activities.

Therefore, for children's future growth and development in fundamental motor skills and further sporting activities, it is important for them to increase their motor skills performance level right from the early childhood stage. Deducing from all the literature reviewed in this chapter it can be said that engaging children in appropriately designed instructional programmes with traditional games as the instructional strategy at the early years of schooling can help children to acquire, develop and improve upon their fundamental motor skills.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

The purpose of this study was to determine the effect of an 8-week traditional game programme as an instructional strategy on kindergarten two pupils' overarm throwing skill development and performance. Secondly, this study aimed at finding out the developmental level of overarm throwing skill performance of Esau Ofori Kindergarten 2B pupils at the pretest and posttest stages. This chapter looked at the research design, the population, setting, sample and sampling technique, validity and reliability of the instrument, instrumentation, testing procedures, instructional programme, procedure for data collection and procedure for data analysis.

#### **3.1 Research Design**

A single group, pretest posttest, quasi-experimental design was used to examine the impact of selected traditional games on Esau Ofori Presby KG2B pupils overarms throwing skill performance. The researcher chose this method (Quasi-experimental) because in educational research, children's assignments to classes cannot be changed due to the complexity of the school curriculum. Again, the researcher chose single group pretest- posttest design in order to establish the treatment effect of the traditional games as an instructional strategy on the subjects overarm throwing skill performance.

##### **3.1.1 Variables for the Study**

The independent variable in this study was an 8-week traditional game instructional programme that was administered to an intact KG 2B class.

The dependent variable was overarm throwing skill performance (process) as measured by Test of Gross Motor Development-2 (TGMD-2) instrument (Ulrich, 2000) and accuracy (product).

### **3.2 Population**

The subjects in this study were pupils from Esau Ofori Presby Kindergarten two (KG2B) class in the Akuapem North District. A Kindergarten class was selected for this study because researchers have found out that by the age of three –six (3-6) the common attractors that describe the overall throwing patterns are more stable and more mature.

### **3.3 Setting for the Study**

The research took place at Larteh Esau Ofori Presby Kindergarten School, which can be located in the Akuapem North District in the Eastern Region of Ghana. The school which is located right at the centre of Larteh town, according to history was established in 2<sup>nd</sup> July, 1992 with a population of twelve (12) pupils, (four (4) boys, and eight (8) girls, with one female teacher and one attendant. The school can now boast of 160 pupils, four female teachers and four female attendants. Facilities in the school as far as Physical Education is concerned include an uncompleted building which is being used as a playing field and a sand base where they do play. They have one eight (8) inches rubber ball and one football.

### **3.4 Sample and Sampling Technique**

Purposive sampling technique was used to select the class for the study. Prior to the selection of the school for the research, the researcher conducted a survey in the schools on pupils average age. It was realized that most of the schools in the cluster were having pupils who were more than 6 years in kindergarten two. Esau Ofori KG two B

class was found to have an average age of five years six months old, it is based on this that the researcher purposively selected the school and that particular class for the study.

Thirty seven (37) pupils from Esau Ofori Presby Kindergarten Two B (KG2B) were therefore used for the study. The class was made up of twenty two (22) boys and fifteen (15) girls aged between four (4) and five (5) years eleven months old. Since it was an intact class, all the subjects were involved in the research.

### **3.5 Instrumentation**

In order to make it easier for the researcher to assess the performance level of pupils overarm throwing skills, the researcher used the Test of Gross Motor Development instrument designed by Ulrich in the year 2000.

The TGMD-2 instrument designed by Ulrich (2000) was used to code the performance level of pupils' overarm throwing skill. In order to assess the motor skills level of the subjects, the test of Gross Motor Development-Second Edition (TGMD-2; Ulrich, 2000) was a suitable and efficient tool to be used by the researcher.

The instrument is designed in such a way that each participant has two trials with a total mastery standard skill score of eight (8) points. Thus, each criterion if well executed and present in the subject's overarm throwing skill performance attracts one (1) point for each trial. In all, a well executed overarm throwing skill at the mastery level with all the criteria as stated by the TGMD-2 instruments attracts 8 points.

### **3.6 Validity and Reliability of the Instrument**

The instrument has already been validated and used by experts in the field of motor development researches over the years outside Ghana. The instrument was adopted by the researcher therefore the environmental conditions and the characteristics of the

pupils may vary. To test reliability, prior to the conduction of the actual research, the researcher carried out a pilot test of the traditional games programme on similar subjects with similar characteristics at Mamfe Methodist KG2A in the Akuapem North District. This was to assess the feasibility of using traditional games as an instructional strategy. The TGMD-2 instrument was used to code the data collected during the pilot test and also used as a practice coding for both the researcher and her two research assistants. After the practice coding sessions, the inter-observer agreement (IOA) was computed using the general formula proposed by Siedentop and Tannehill (2000, p336).

Thus

$$\frac{\textit{Agreement}}{\textit{Agreement} + \textit{Disagreement}} \times 100\%$$

The reliability coefficient calculated was 82% thus  $r = .82$ . Thus the trials for both pretest and posttest for each subject was coded and independently scored by the observers. The inter observer reliability was found as 81.8 on pretest and 82 on posttest which indicates a very high reliability between the observers.

### **3.7 Testing Procedure**

Prior to the study, and after the researcher had simple randomly selected the class from the cluster of schools for the study, the informed consent letter from the Department of Health, Physical Education, Recreation and Sports of the University of Education, Winneba endorsed by the Head of Department was delivered to the Head of the selected school. The researcher briefed the Headmistress and the class teacher of KG2B on the main purpose of the study. A date (1st February, 2012) was scheduled between the researcher and the class teacher for the pretest.



The pretest took place in a very large empty classroom which the school used as a playing ground. During the pretest, pupils were not told as to how they should carry out the overarm throwing skills but the researcher urged them to throw the tennis ball. The subjects were asked to stand on a white line marked 20 feet from a wall as stated by the TGMD-2 instrument designed by Ulrich in the year 2000 and throw a tennis ball as hard as they could to hit the wall. The pretest was videotaped using a digital Sony camcorder video camera with two new energizer batteries. Pupil's overarm throwing performance was coded later from the video tape recorder.

After the pretest, the researcher created sixteen lessons relating to overarm throw but using traditional games and used them to teach the class during their physical activity period on their time table for eight (8) weeks. This duration (8weeks) was chosen for the instructional programme because Graham, Holt/Hale and Parker, (2007) documented that “an effective motor skill instruction should have duration of around 8 to 12 weeks meeting two days per week”. Typically, 16 to 24 instructional sessions should be arranged to deliver the programme and each session should take 30 to 45 minutes. The lessons were taken twice per week of 30 minutes duration for each lesson.

One week after the last lesson the researcher conducted the posttest to see whether the traditional games programme implemented had any effect on their overarm throwing skill performance at the same venue where the pretest was carried out. The subjects were asked to stand on a white line marked 20 feet from a wall as stated by the TGMD-2 instrument designed by Ulrich in the year 2000 and throw a tennis ball as hard as they could to hit the wall just as they did at the pretest. The conditions under which the posttest was conducted were the same as the pretest. Also, the same instrument and tools

used for assessing and data collection of subjects overarm throwing skill performance at the pretest stage were the same as that of the posttest stage. Both process and product measure of the throwing performance were measured for both boys and girls. The evaluation of the throwing performance occurred at the posttest stage which took place one week after the implementation of the traditional game instructional programme.

### 3.8 Traditional Games Instructional Programme

Table 1 below shows the outlined of the selected traditional games and the week for the teaching of that traditional game

**Table: 1 Selected Traditional Games for the Eight Weeks.**

WEEK	TRADITIONAL GAME/ACTIVITY
ONE	OLE
TWO	CLEAN YOUR HOUSE (PRAPRA WO FI)
THREE	STEP INTO IT AND THROW(TIA MU NA TOW)
FOUR	STAY (GYINA HO)
FIVE	SWERVE (WO BOAA)
SIX	STORM THE HOUSE (HYE WO FI MA)
SEVEN	SHOOT THE BIRD (TOW ANOMAA NO)
EIGHT	COMBINATION OF CLEAN YOUR HOUSE AND OLE

Lesson plans were developed by the researcher who had 2 years of teaching experience in Physical Education. An expert from the Health, Physical Education, Recreation and Sports Department of the University of Education who have experience in

the area of motor learning and development checked the lesson plans with regard to content, task analysis, critical elements of skills and equipment modifications. Sixteen lesson plans were developed based upon the critical elements of the skill, task analysis of the skills being taught, and the pretest level of the subjects. Critical elements were embedded into the lesson plans in terms of providing feedback. For each skill, a task analysis was conducted developing a series of traditional games that could go from easy to more complex. The task analysis involved manipulating different factors for the throwing skill. For example, the factors that were manipulated in the overarm throwing involved distance from target and the size of the target.

For the content of the 8-week traditional game as an instructional strategy to improve pupils overarm throwing skills, the researcher started the lessons from 8th February, 2012 to 28th March, 2012, with the traditional games instructional session scheduled on every Tuesday and Wednesday. The posttest took place one week after the instructional programme (4th April, 2012). Detailed description of the programme schedule was presented day by day in the form of lesson notes which consisted of:

1. Warm up activities involving locomotor and non locomotor activities such as pupils imitating trees and birds' movement, stretching, swaying, balancing, hoping etc.
2. Lesson on the selected traditional game for the week
3. Cool down activities such as singing to where the researcher is.

### **3.8.1: Week One**

The activity for the first week was “Ole” and the equipment used for this game was six (6) empty baskets (kenten) and forty oranges and a clear space which was

demarcated by the researcher. The purpose of this game was to develop the stepping and the overarm throwing patterns of the pupils. This game aimed at developing balance and coordination in the subjects. Before the introduction of the game to pupils, they were taken through some warm up activities which involve imitating trees and birds' movement. After that children were led through stretching and drills that involves the use of the arm to prepare the muscles in the arm towards the activity to be performed. The researcher divided the class into six groups and lined each group up behind a white line drawn on the floor. A basket was placed 10m away in front of the demarcated line for each group. Player one for each group stood with the non throwing leg on the line and at the blast of the whistle each number one player threw the orange into the basket followed by the next player till the last player in each group had had his or her turn. The researcher repeated the game three times and the group which had the highest number of oranges inside the basket in each round won the game. For the second lesson in the same week, pupils were made to go through the same game "ole" but the distance for each trial was increased from 10m, 15m to 20m.

### **3.8.1: Week Two**

During the second week, pupils were taken through a game called "Prapra wo fi" for this game the researcher divided the class into two groups. The equipment used was 40 socks balls and a 30m rope. The purpose of this game was to develop their throwing hand and the opposite foot coordination. Prior to this lesson, the researcher hanged the rope 3m high to divide the demarcated area into two equal halves. Each group in a scattered formation stood on one side of the field (house) with each pupil with a ball. On the command go, both teams began to throw their balls and any other ball that would land

in their part of the field (house) over the rope to their opponent side of the field (house) as fast as they could while their opponents also did likewise. Pupils were asked to throw all balls using the overarm throwing pattern and as far back into their opponents' backyard. The game was stopped after each 3 minutes and balls in each team's house were counted. A mark was deducted from the group whose member used other throwing patterns apart from the overarm throw and also a player who threw with the same hand and step with the same foot (Ipsilateral). The team with fewer balls in their house won the game. This game aimed at developing arm-foot coordination, balance and power.

### **3.8.3: Week Three**

The game for the third week was "tia mu na tow" the equipment used were four oranges. The researcher drew three big foot steps on the floor considering left handed pupils and on the signal go, pupils were to place their foot which was opposite their throwing arm in the big foot up on the floor and threw the ball as hard as they could to hit the wall. The purpose of the game was to work on pupil's footwork (contralateral) and the follow through after the throw has been executed. The aim of this game was to develop their arm- foot coordination, balance and power.

### **3.8.4: Week Four**

During the fourth week of the instructional programme, the subjects were taken through a game called "gyina hɔ". The purpose of this game was to help pupil to throw at targets. The aim of this game was to develop the subjects' balance, reaction time and arm-foot-eye coordination. The subjects were divided into six groups. With this game the equipment used was six socks balls and a big circle drawn on the floor for each group.

The researcher after a warm up and stretching activities gave the subjects the rules for the game. The subjects in each group were asked to stand outside the big circle with their names written in front of them on top of the circle. One player stood in the center of each circle holding a ball while the rest of the players' stood outside the circle in a ready position to escape. The player in the middle threw the ball up and called any of the players outside the circle's name. That player upon hearing his or her name ran to the middle of the circle and caught the ball and shouted "stay (gyina hɔ)" at the same time the remaining players scattered. Upon catching the ball he or she shouts stay and the entire fleeing players froze. He or she was allowed to take two to three giant steps and throw the ball to hit any of the players in any direction. The player that the ball hit or touched his or her clothes or body became the centre man to start the game but if the thrower missed the ball by it not touching anybody he or she continued to be the middle man/woman.

### **3.8.5: Week Five**

During the fifth week, the subjects were taken through the game called "wo boa". The equipment used was twenty socks balls. Pupils were divided into three groups for this game. The purpose of this game was to throw on target and also to step and throw with follow through. Pupils in their groups were divided into two and one group was made to stay in a very big circle drawn on the floor for each group. The rest stayed fifteen meters from their various circles and tried to throw the ball at any of the players in the circle whilst they also prevented the ball from touching them. After every three minutes, the players changed over for those outside to enter the circle whilst those who were in the circle stay outside and took their turns to throw in each group. The team which was able

to throw more of their balls to hit the target won the game. This game was aimed at developing balance, reaction time and agility in the subjects.

### **3.8.6: Week Six**

The sixth week of the instructional programme saw subjects engaged in a game called “hyɛ wo fie ma”. The equipment used for this game was forty oranges and a rope. The purpose of this game was for pupils to step contralateral with non throwing arms brace in front across chest and also to work on the subjects arm and foot follow throw. After the warm up pupils were briefed on the rules for the game thus any throw made with the player standing with both feet together was not counted and also any throw made with the same feet and the same arm was also not counted likewise all throws made with any other skill apart from overhand was not counted. The subjects were divided into seven groups namely, a, b, c, d, e, f, and g. Group A started the game by standing on one halve of the demarcated playing ground whilst the rest of the groups stayed at the other side of the playing ground to retrieve all balls that were thrown there. Each team tried to throw as many balls as they could to the other side of the playing ground without crossing the centre line which was demarcated with a rope. Each team was given three minutes to throw all the forty balls into their opponents’ area. At the end of the three minutes the researcher stopped the game and counted the number of balls thrown correctly according to the rules to the other side. The group or team which at the end of the game had the highest number of balls thrown was declared as the winner of the game. The game was to develop pupils balance, agility and power.

### **3.8.7: Week Seven**

Subjects were instructed in a game called “tow anomaa no” during the seventh week of the traditional games instructional programme. The purpose of the game was for subjects to throw a ball using the correct overarm throwing patterns with emphasis on contralateral stand and backward swing of throwing arm to hit several balloons (targets) hanged around the classroom. The subjects were divided into three groups with each group working at a different station in the same classroom. The researcher gave the rules for the game and after warm up instructed the subjects to throw the balls to hit the balloons as many times as possible. The team which hit much balloons using the correct overarm throwing stance and swing of throwing hands won the game. This game aimed at developing balance and power in the subjects.

### **3.8.8: Week Eight**

The last week of the instructional programme saw the researcher taking the subjects through a combination of games practiced as far as overarm throwing skill was concerned. The researcher divided the subjects into three groups and created three stations with different overarm games. The subjects at the first station were engaged in a game called “ole”, the subjects at station two were also engaged in a game called “clean your house” whilst the third station saw subjects performing swerve. The subjects after every five minutes change over stations until each group had gone through all the stations.



### **3.8.9 Instructional Approach of the Motor Skill Programme**

A traditional instructional approach was followed by the researcher in the implementation of the traditional game programme. Rink, (2006), referred to this approach as “interactive teaching”. The student autonomy during the instructional period was low with the researcher controlling all aspects of the teaching and learning environment such as start time, stop time of the games or the task modifications. The researcher used a variety of effective teaching strategies such as demonstrations, explanations, feedback, cue words, tasks modifications (e.g. extending and refining) and manipulation of factors such as, distance, target, movement of ball or person, and physical prompts during the implementation of the selected traditional games.

For each session in the traditional game programme, the assigned skill for the session were explained with the cue words by the researcher, then, the whole skill was demonstrated in a sequence for children several times. As indicated in the literature, correct demonstration is an essential teaching strategy for young children (Graham et al., 2007) who are visual learners and they can copy the demonstrator quickly. Landin (1994) and Rink (2006) opined that using cue words during teaching process is one aspect of effective teaching based on this the researcher used a lot of cue words in all the teaching session. For example, in the cue words of “step with opposite leg of throwing arm before throwing helped the subjects to easily understand what they needed to do before they executed the overarm throw. The researcher also gave the subjects a lot of positive, corrective and specific feedbacks based on their pretest performance.

Task modification was found to be another strong part of the motor skill learning and acquisition. Rink (2006) defined task modification as “Informing, extending, refining and applying of the task”. These elements are major components which help children to learn motor skills in physical education (Graham, Holt/Hale & Parker, 2007). Each skill as a task was extended to make it harder or easier based on children’s success in the overarm throwing skill. In this study most of the task modification took place during the second day in each week for the instructional programme. The ideas behind the extension are that if children have a high rate of success for the task, they become motivated to perform the task, they might like the challenges to complete the task and they might practice more (Graham, Holt/Hale & Parker, 2007). Children perform well when they know the outcome of their previous skill performance. For this reason, the researcher manipulated the, distance, and targets of throw to make it more challenging to the subjects. Distance from targets was short (5 feet) at the beginning of the instruction, then, it gradually increased (6, 8, 10 and 15 feet) to make the task harder and provided challenges for children. Target size was also manipulated from big to small sizes. The motor development literature supports the role of developmentally appropriate activities and the importance of task manipulations in teaching motor skills (Gallahue & Ozmun, 2006; Haywood & Getchell, 2009).

Hastie & Saunders, (1991) stated that limited equipment pose as a barrier to opportunity to practice motor task in physical education settings. Although developmentally appropriate equipment was recruited for the traditional game programme, Esau Ofori KG did not have any appropriate play ground for opportunities to practice physical activities. For this reason, an uncompleted building was utilized for the

implementation of the programme whenever the weather was favourable for pupils to play outside.

### **3.9 Procedure for Data Collection**

It is an undisputable fact that, the reliability and validity for data collection depends largely on the techniques used in the collection of the data. It is also true that, the ideal way to study a process is to watch it happen and having it extent measured. Taking the nature of the study into consideration, the researcher made use of observation and interview. Data was collected on only the overarm throwing skill performance (process measure) and was observed and evaluated by using the TGMD-2 instrument designed by Ulrich (2000). (See Appendix D for the copy of the TGMD-2 instrument). The product measure of pupil's overarm throwing performance was pupils throwing to hit a target from a distance of 20m. With that, the researcher believed, helped pupils to know the outcome of their throwing performance. To buttress the information gathered through the observation, the researcher also interviewed the subjects using guided questions; (see Appendix B)

### **3.10 Procedure for Data Analysis**

Data was analyzed using both descriptive and inferential statistics. The raw scores collected during the pretest and posttest were entered into the “Statistical Package of Social Science version 16.0 for windows” (SPSS16.0) software for analysis. The Mean (M), standard deviations (SD), and percentages of the variables of the overarm throwing skill were calculated. Since the subjects were tested twice, the statistical technique used for the analysis was dependent t-test. Also, the differences in pretest and posttest of the

subjects overarm throwing skill performance, thus before and after the traditional games instructional programme was calculated generally followed by gender. For gender, a two sample t-test assuming unequal variance set at 0.05 Alpha level for two tailed was used to analyze male and female performance in the pretest and posttest.



## CHAPTER FOUR

### RESULTS AND DISCUSSIONS

The purpose of this study was to determine the effect of an 8-week traditional game programme as an instructional strategy on kindergarten two pupils' overarm throwing skill development and performance.

This chapter deals with the descriptive statistics of the Mean and Standard Deviation of the ages of the subjects, the developmental stages of the overarm throwing skill during the pretest the posttest stages. In order to analyze the difference between the subjects overarm throwing skill performance at both the pretest and posttest stages, an analysis of dependent sample t-test was used to find out the difference in the subjects raw scores before and after the implementation of the traditional game programme. Also, a two sample t-test assuming unequal variance was used to compare the performance by gender at both pretest and posttest stages.

**Table 2: Results of Ages (yrs) of all the Subjects (N = 37) and by Gender**

	N	Mean Age	SD Age	Min Age	Max Age
All subjects	37	5.38	0.31	4.5	5.11
Male	22	5.24	0.29	4.5	5.10
Female	15	5.51	0.33	4.6	5.11

The subjects for this study were thirty seven (N=37) of which twenty two (22) were male (N=22) whilst fifteen (15) were females (N=15) as depicted in Table 2 above.

From table two, it can be said that the mean age of all the subjects used for this particular study was 5.38 years and the subjects ages ranged from 4years five months to 5years 11 months old. The Mean age for the male subjects was 5.24 with a standard deviation of 0.29 while the Mean age of their female counterparts was 5.51 with a standard deviation of 0.33. This showed that the female subjects were 0.27 older than the male subjects.

#### 4.1 Results of Interview

In the second part of the field study, a short interview with each child was conducted in Larteh Presby KG 2B Classroom. Critical points of interviewing techniques were taken into account. After the observational period, children were asked to answer some questions in the form of conversation. (See appendix B for sample structure of interview questions). The questions were designed to collect specific data which could not be taken through observation, such as, frequency of subjects participating in games and other physical activities at home and whether their favorite games involves throwing.

**Table 3: Number of times subjects participated in playing games during the week at home**

No of Times per Week	Frequency/Percentages					
	Male	%	Female	%	overall	%
Everyday	3	13.6	0	0	3	8.1
1-2 times in a week	15	68.5	3	20	18	48.7
3-4 times in a week	4	18.2	1	6.7	5	13.5
Do not do any exercise	0	0	11	73.3	11	29.7
Total	22	100	15	100	37	100

The above data as presented in table 3 was obtained through an interview that the researcher had with the subjects prior to the implementation of the instructional programme. It can be seen from the table above that; majority of the subjects 26

representing (70.3%) stated that they participated in physical activities and games at home while 11 subjects representing 29.7% said they do not do any physical activity at home.. From the table it can also be deduced that all the boys participate in some sort of physical activity during the week as compared to their female counterparts with an absolute number of eleven (11) representing 73.3% who stated that they do not take part in any physical activity at all during the week. This might have accounted for their poor performance in the overarm throwing skills during the pretest stage.

For the second interview question the researcher wanted to know whether the subjects have been involving themselves in any physical activities that involves throwing both at home or in school.

**Table 4: Responses to whether subjects participate in games that involve throwing at home or school**

Response	Male	%	Female	%	Overall	%
Yes	5	22.7	2	13.3	7	18.9
No	17	77.3	13	86.7	30	81.1
Total	22	100	15	100	37	100

Table 4 above showed the level of participation in games involving throwing by the subjects interviewed prior to the implementation of the instructional programme. The table indicates that, majority of the students with an absolute number of 30 representing 81.1% does not engaged in any form of throwing activities both at school and at home. Only 7 out of the 37 subjects representing 18.9% said they have been playing games that involve throwing of objects. This can be interpreted as most of the subjects used for the research do not play games that involved throwing.

Considering gender, the table 4 above shows that an absolute number of five (5) males representing twenty two point seven percent (22.7%) said they play games involving throwing of objects whilst a large number of seventeen (17) representing seventy seven point three percent (77.3%) said they do not take part in games involving throwing. An absolute number of thirteen (13) females representing 86.7 responded that they do not play games that involve throwing at both school and home. This implies that though pupils were taking part in games, their games were not involving throwing. This might have accounted for their poor performance in the overarm throwing skill performance during the pretest stage.

#### **4.2 Test of Research Questions and Null Hypotheses**

1. Research Question 1: What is the developmental level of kindergarten two pupils' overarm throwing skill performance?

H<sub>0</sub>: There would be no significant difference in the developmental level of pupils overarm throwing skill at pretest and posttest stages.

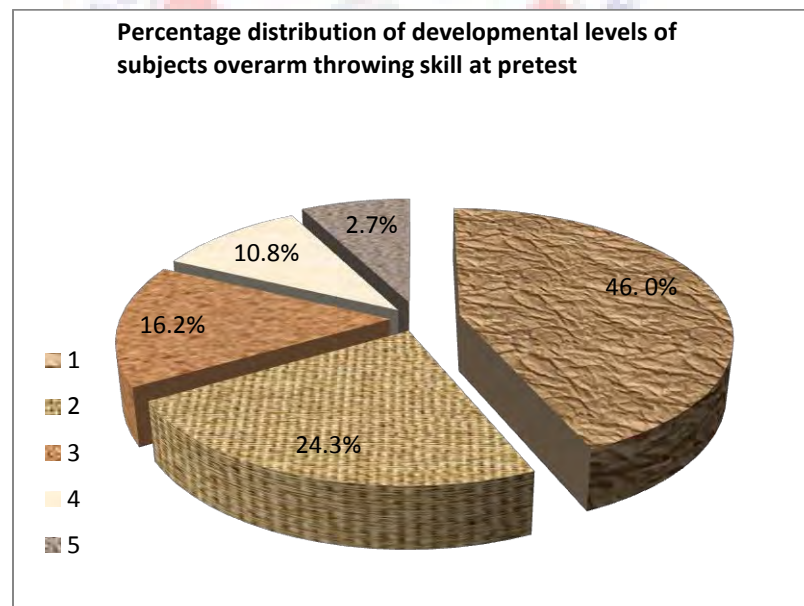
$$H_0: \mu_{\text{pretest (developmental level)}} = \mu_{\text{posttest (developmental level)}}$$



**Table 5: Pretest results of developmental stages of KG2 pupils overarm throwing skill Performance**

Stage	Male		Female		Overall	
	Male	%	Female	%	Overall	%
1	10	45.5	7	46.7	17	46.0
2	8	36.4	1	6.7	9	24.3
3	1	4.5	5	33.3	6	16.2
4	2	9.1	2	13.3	4	10.8
5	1	4.5	0	0	1	2.7
Total	22	100	15	100	37	100

**Figure 1: Overall pretest result for developmental levels of subjects overarm throw skill**



From figure one and table five above, an absolute number of seventeen (17) representing forty six percent (46%) were performing the overarm throwing skill at stage one which appears to be the highest stage that most of the subjects were performing the overarm

throwing skill during the pretest stage. In terms of gender, eighty one point nine percent (81.9%) of the males were performing at stages one and two whilst an absolute number of eight (8) girls representing 53.4% were performing the overarm throwing skills at stages one and two. Forty six point six percent (46.6%) of the girls were throwing at stages three and four whilst an absolute number of three (3) representing 13.6% of the boys were performing at stages three and four. This implies that most of the girls (12) were performing the overarm throwing skills at stages one and three with an average age of 5.51 years as compared to their male counterparts who were also performing with higher frequency at stages one and two.

**Table 6: Posttest results of developmental levels of KG2 pupils overarm throwing skill performance**

Stage	Male		Female		Overall	
	Male	%	Female	%	Overall	%
1	0	0	1	6.7	1	2.7
2	1	4.6	3	20.0	4	10.8
3	1	4.6	4	26.7	5	13.5
4	6	27.2	2	13.3	8	21.6
5	14	63.6	5	33.3	19	51.4
Total	22	100	15	100	37	100

**Figure 2: Overall posttest result for developmental levels of subjects overarm throwing skill**

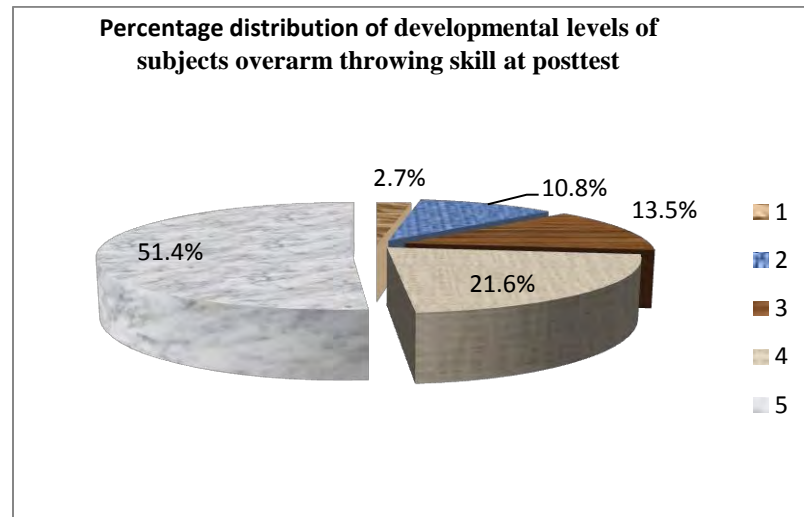


Table 6 and figure 2 above presents the posttest results on subjects overarm throwing skill performance as analyzed using the total body approach checklist (Wild, 1986) which identifies the essential criteria for each of the stages of the overarm throwing skill.

From the table, majority of the subjects with an absolute number of nineteen representing 51.4% were observed to be performing the overarm throw at stage 5 which is the mastery stage of the skill while 51.2% were also observed to be performing at stages 2, 3 and 4.

In terms of gender, the same table above (table 5) showed that after the implementation of the instructional programme, fourteen (14) of the male subjects representing 63.6% were exhibiting the mature patterns of the overarm throw as compared to five (5) female subjects representing 33.3% who were also performing at the mastery level (stage 5). The table also depicts that 31.8% of the male subjects were throwing at stages 3 and 4 whilst 40% of the female subjects were throwing at stages 3 and 4. This result can be interpreted

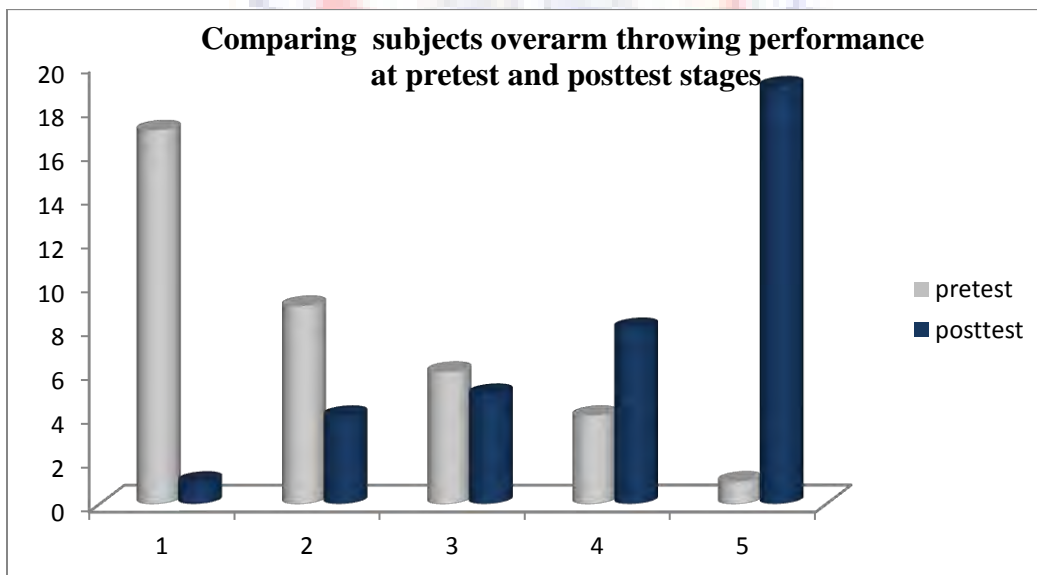
as the male subjects improved in their overarm throwing skill more than their female colleagues at the posttest.

**Research Question 2:** What will be the difference between the TGMD-2 results in overarm throw at the pretest and posttest stages?

H<sub>0</sub>: There would be no significant difference in overarm throwing skill performance at pretest and posttest stage.

$$H_0: \mu_{\text{pretest}} = \mu_{\text{posttest}}$$

**Figure 3: Comparing Subjects Overarm Throwing Performance at Pretest and Posttest Stages**



**Table 7: Overall differences in subjects overarm throwing skill performance at the pretest and posttest stages**

TEST	N	MEAN	VARIANCE	DF	T	P-VALUE
PRE TEST	37	2.378	1.30	36	-11.59	0.00
POSTTEST	37	6.973	1.63			

With this question the researcher was interested in finding out whether the traditional games used as a teaching strategy will have any effect on the subjects overarm throwing skills performance at the posttest stage.

The result from figure two and the table 7 above indicated that there was a significant change in the pupils overarm throwing skill performance from pretest to posttest. Comparing the means of the raw score for pretest and posttest indicates that the scores increased from (M= 2.378., SD= 1.301) to (M=6.973, SD= 1.63). In all pupils performance from pretest as compared to the posttest shows a massive improvement in their overarm throwing skill at the posttest stage. Conducting a dependent t-test to evaluate whether a significant change occurred between the pretest and posttest results proof at  $df = 36$  a t ratio of -11.594 is significant at 0.05 so the null hypothesis is rejected. The researcher concludes with 95% confidence that the subjects performed better at the posttest stage than the pretest stage.

In all, subjects improved upon their overarm throwing skill performance. This implies that children have individual differences when it comes to learning styles so teachers at the basic and kindergarten schools should not be myopic about their methods and strategies for teaching but rather should employ different teaching strategies if they really

mean to meet the fundamental motor skills needs of their pupils at the early stages of school. Savage (2002) cited that when children are given enough opportunity to practice fundamental motor skills they improve so pupils at the basic level should be given enough time to practice and learn fundamental motor skills.

**Research Question 3:** What was the gender difference in overarm throw at the pretest and posttest stage?

Ho: There would be no gender difference in overarm throwing skill performance at pretest and posttest stages

$$H_0: \mu_{\text{boys}} = \mu_{\text{girls}}$$

**Table 8: Gender difference in overarm throwing skill performance at the pretest stage**

Gender	N	M	VARIANCE	DF	T	P-VALUE
Male	22	3.00	1.38	36	0.15	0.881
Female	15	2.98	1.25			

Table 8 above presented the pretest scores of subjects in the overarm throwing skill performance as measured by the TDMG-2 instrument at the pretest stage. From the table, the Means and Standard Deviations for the raw scores for the boys (M= 3.0, SD= 1.38) as compared to that of the girls (M=2.98, SD= 1.25) indicates that the overarm throwing skill performance of the boys were not different from the girls thus they both performed poorly at the pretest stage. To evaluate whether a significant change occurred, a two sample t-test assuming unequal variance was conducted using the 0.05 level of

significance, the critical value for two tailed test was  $\pm 2.021$ . Our obtained t value at (df = 36)  $p = 0.881 > 0.05 = 0.15$  is lower than the critical value. We therefore have sufficient evidence to accept the null hypothesis and conclude that pupils were indifferent in their overarm throwing skill at the pretest stage. This implies that both boys and girls level of performing the overarm throwing skill was insignificant as they both did poorly.

Halverson, Robertson & Langendorfer (1982) and Thomas and French (1985) in their research in overarm throwing skill found out that boys in all cases outperform girls in overarm throwing skill at all levels but the findings of this research indicates that both boys and girls were performing at the same level at the pretest stage as there was no significant difference in their overarm throwing performance. This may be accounted to difference in environment and characteristics of the subjects used for this study.

**Table 9: Gender difference in overarm throwing skill performance at the posttest**

Gender	N	M	SD	DF	T	P-VALUE
MALE	22	7.09	1.38	36	3.734	0.01
FEMALE	15	5.33	1.37			

When comparing the difference of their overarm throwing skill performance after the traditional games instructional programme by gender, it came out that the male subjects had a higher improvement in their overarm throw (M= 6.50, SD= 3.30) than the female subjects (M= 5.2, SD = 1.78). To attest for this significant change, a t-test for two samples assuming unequal variance was calculated and for the level of significance set at  $p < 0.05$ , the critical value for a two tailed two sample t-test assuming unequal variance

was  $\pm 2.021$ . Our obtained value for  $t$  ( $df=36$ ,  $p(0.01) < 0.05$ ) = 3.734 is higher than the critical value at  $df=36$ . We therefore have sufficient information to reject the null hypothesis and conclude that there is a significant difference between the male and female overarm throwing performance at the posttest stage.

**Research Question 4:** What was the difference in product measure (target) of kindergarten pupils overarm throwing skill performance at the pretest and posttest stages?

Ho: There would be no significant difference in product measure (target) between both groups at pretest and posttest stages.

$$H_0: \mu_{\text{pretest (target)}} = \mu_{\text{posttest (target)}}$$

In order for the subjects to know the outcome of their throwing effort, the researcher collected data on their throwing accuracy. To determine accuracy as a product measure of subjects overarm throwing performance, they were made to throw a ball on targets which was set 15m away from the starting line with each subject given three trial opportunities. All trials were recorded as on target when the ball hit the target or missed based on the number of times each subject hit or missed out of the three trials. Each subject received a score that ranged from 0 - 3. Means and standard deviations of the data collected on their accuracy are presented in table 9 for both the pretest and posttest phases.



**Table 10: Difference in product measure (target) of KG2 pupils overarm throwing skill performance at the pretest and posttest stages?**

	N	MEAN	VARIANCE	DF	T	P-VALUE
PRE TEST	37	0.667	0.649	36	-7.602	0.05
POSTTEST	37	1.692	0.482			

Considering the overall Means for the subjects accuracy in overarm throwing, it was found out that most subjects were not able to hit the target during the pretest stage (M=0.667, SD= 0.649) but there was an improvement at the posttest stage (M=1.692, SD= 0.482). This implies that most of the subjects were able to hit target after the traditional games instructional programme. During the observation, the researcher found out that most subjects were hitting the larger targets more often as compared to the smaller ones at the posttest stage.

**Table 11: Gender difference in product measure (target) of KG2 pupils overarm throwing skill performance at the pretest and posttest stages?**

PRE TEST	GENDER	N	MEAN	SD	DF	T	P-VALUE
	MALE	22	0.563	0.75	36	-0.747	0.00
	FEMALE	15	0.529	0.72			
<b>POSTTEST</b>							
	MALE	22	1.739	0.565	36	-0.518	0.046
	FEMALE	14	1.625	0.383			

Table 11 above showed that in terms of subjects throwing to hit the target, the male subjects were hitting the target ( $M=0.563$ ,  $SD=0.75$ ) slightly ahead of the female subjects ( $M=0.529$ ,  $SD= 0.72$ ) before the implementation of the traditional games instructional programme. In terms of target hitting, the researcher found out at the posttest stage that the boys were still ahead ( $M= 1.739$ ,  $SD= 0.565$ ) of their female counterparts ( $M=1.625$ ,  $SD= 0.383$ ) who also showed improvement at the posttest stage. To determine the significance of subjects' product measure (target hitting) of overarm throwing skill, t-test: Two-Sample Assuming Unequal Variances was used to analyze the data. The result indicated that  $t(36) -0.747$ ,  $p(0.00) < 0.05$  at the pretest stage as compared to  $t(36)= 0.518$   $p(0.046) < 0.005$  was significant so we reject the null hypothesis and conclude that gender difference exist in subjects product measure (target hitting) of overarm throwing skill performance.

#### **4.3 Discussions**

The first hypothesis stated that; there would be no significant difference between pupil's developmental stages in overarm throwing skill performance. The results as reported in table 5 and 6 strongly demonstrated that during the pretest stage of this study, none of the girls observed was able to perform the overarm throw at stage five (5). Stage two (2) overarm throwing which involved a block rotation of the trunk with all-out force was mostly observed among the throwing patterns of the boys whilst the girls were throwing ipsilateral (stage three) at the pretest stage. These findings imply that some developmental instruction and exposure are needed to advance the development of throwing patterns at the early stages as opined by Garcia and Garcia (2002). That is,

instruction and practice that the researcher gave to the subjects seems to be a key factor for the development of the mature throwing patterns as observed in the posttest stage. This supports the findings of Halverson and Robertson (1979) which indicated that instruction plays a significant role in the development of mature throwing patterns in young children.

The researcher also observed at the pretest stage that the subjects were not aware of how they should position their body before executing the overarm throw. Thus the subjects at the initial stage were throwing in their own natural way but during and after the instructional programme majority (51.4%) of subjects learnt to step, move their arms and rotate their bodies as they released the ball with follow through of the throwing arm.

From table 5, it was discovered that the boys were initially throwing at stages 1 and 2, with few (9.1%) of them throwing at stage 4 but after the traditional game instructional programme, they were found to have stabilized at stages 4 and 5 (90.8%) with only one (1) pupil performing at stage 3. Girls on the other hand at the pretest stage were performing mostly at stages 1 and 3 (80%) and after the traditional game instructional programme find stability between stages 3 and 4 with only five (5) of them showing stage 5 throwing patterns. Subjects at the pretest showed very low performance in the overarm throwing skill subtest of TGMD-2 which suggests that the subjects did not have any prior experience with the overarm throwing skills. One of the possible reasons of this result might be due to limited physical activity opportunities available for these children in their home and outdoor environments.

In this study, an observation conducted by the researcher revealed that there was no structured motor skill programme included in the curriculum of the Esau Ofori Presby KG. It was observed that subjects had physical activity sessions which neither followed the curriculum nor involved any motor skill instruction by their classroom teachers during these sessions.

Furthermore, the school had no playing grounds apart from the uncompleted classroom which was being used as a playing ground and also had limited equipment for teaching and learning of Physical Education. This finding implies that there exist numerous individual and environmental constraints for this group of subjects which will go a long way to affect their motor skill acquisition.

Also, early instruction in motor skills is very necessary for children future physical activity participation and motor skill development (Wrotniak, Epstein, Dorn, Jones, & Kondilis, 2006). According to Seefeldt (1980), if children have some degree of fundamental motor skill proficiency, they should be able to apply these FMS to sports and games and be able to participate in more advanced level of activities in their future life. Wrotniak et al. (2006) supported this idea by their study showing a positive relationship between motor skill proficiency and physical activity participation in children from 8 to 10 years of children

#### **4.2.1 Gender differences**

Gender groups were similar in age (Males  $M = 5.24$ ,  $SD = .29$ , Females  $M = 5.51$ ,  $SD = .33$ ), this indicates that the girls used in this research were older than the boys. In

terms of the interview conducted the Males demonstrated that they do participate in games that involve throwing both at school and at home more than the females.

According to Gabbard, (2007), a gender role stereotyping favouring boys over girls' participation in physical activity and sport may be present very early in life. Also, it has been demonstrated that males receive stronger support than females from fathers and peers to begin and continue in sports. These potential interfering social factors may influence not only the motor skill development but also the physical activity behavior of children. This is not far from the findings of this study when during the interview with the subjects came out that an absolute number of thirteen (13) representing 86.7% of the girls do not take part in any physical activity both at school and at home. Physical activity guidelines released (NASPE, 2002) recommend that all children from birth upwards engage in developmentally appropriate physical activity. The implication is that most of these children will grow into adulthood without acquiring the basic movement skills needed for future participation in games and sports. It therefore behooves on us the teachers to create the necessary environment that will help pupils at the early childhood stage to learn and improve upon these fundamental motor skills.

Comparing subjects' performance from pretest to posttest indicates that the boys' performance in the overarm throwing skill was significantly higher than that of their female counterparts. This finding is in contrast to the findings of Savage (2002) who find out that girls perform at the same level with boys in overarm throwing skill as an object control skill after an 8-week instructional programme. The discrepancies between the current study results may be due to the fact that games selected are being regarded by most as masculine.

Contrary to the above, this finding is rather in line with what Halverson, et al (1982) and Thomas and French (1985) came out with; that boys perform better in overarm throw than girls. The study also showed that the female subjects were not able to perform equally at the same level with their male counterparts although there was a significant improvement in their pretest to posttest overarm throwing performance.

Results specified that there was a significant difference before and after the 8-week selected traditional game instructional programme. Generally speaking, the contribution of the programme design was an answer to the greater improvement observed at the posttest stage in subject's overarm throwing skill performance. As the programme schedule mentioned in chapter three, the activities were mainly on improving their overarm throwing skills with the process variable as the main focus.

Furthermore, Hamilton and Tate (2002) stated that overarm throwing is one of the most difficult object control skills to be performed by children since it involves the simultaneous coordination and control of the upper and lower limbs, trunk and posture, the 8-week traditional games instructional programme entirely focused on activities involving overarm throwing. The traditional games selected by the researcher to improve upon the subject's overarm throwing skill helped most of the subjects to move from their pretest skill level to the mastery level for performing the overarm throwing skill where all the criteria elements stated by Ulrich (2000) for overarm throw were present.

French and Thomas (1985) also found gender differences in product scores for throwing as early age three. In other to get the product score of their overarm throw in this study, the subjects were asked to throw balls at bigger and larger targets and data was

collected on them as presented in chapter four table 11. The data for product outcome of subjects overarm throwing for this study supports the findings of French and Thomas (1985), since males' outperformed females.

#### **4.2.2 Influence of Traditional Games Instructional Programme on Subjects Overarm Throwing Skill Performance**

There were no significant differences between both groups (male and females) at the pretest. However, there was a significant effect from pretest to posttest performance with an effect size of 4.595. This effect size was moderate indicating that 45.95% of the variance in posttest scores was accounted for by the eight weeks traditional games throwing lessons. This effect size is smaller than other effect sizes reported in the motor development literature: where large effect sizes in the motor skill programme were found, .63 (Goodway et al., 2003), .72 (Goodway & Branta, 2003), .82 (Goodway & Robinson, 2009) and .92 (Hamilton et al., 1999). The moderate effect sizes might be explained by the smaller sample size.

Several studies examined the effect of instruction on throwing performance (Garcia & Garcia, 2002; Lorson, 2003; McKenzie et al., 1998; Stodden, 2002; Thomas et al., 1994) and found that proper instructional strategy positively affected the students' motor skills acquisition and development. A traditional instructional approach was chosen in order to deliver the overarm throwing skill to the subjects. This instructional approach according to Becker & Carnine, (1980) focuses on student learning with low autonomy of children. Under the traditional instruction approach, the subjects are obliged to follow the directions of the instructor in a highly structured teaching-learning

environment. Ayers et al. (2005) found that elementary students were successful in jumping performance when direct instruction was provided.

The instructional strategies used in this study involved traditional games and aside that the researcher employed demonstrations, explanations, cue words, feedback, task modifications, and manipulations of factors of all the selected traditional games. For each session in the traditional game programme, the assigned skill for the session were explained with the cue words by the researcher, then, the whole skill was demonstrated in a sequence for children several times. As indicated in the literature review, correct demonstration is an essential teaching strategy for young children (Graham et al., 2007) who are visual learners and they can copy the demonstrator quickly. Landin (1994) and Rink (2006) opined that using cue words during teaching process is one aspect of effective teaching, based on this; the researcher used a lot of cue words in all the teaching sessions. For example, in the cue words of “step with opposite leg of throwing arm before throwing helped the subjects to easily understand what they need to do before they execute the overarm throw.

The researcher also gave the subjects a lot of positive, corrective and specific feedbacks based on their Task modifications (another strong part of motor skill programme). Rink (2006) defined the task modifications as informing, extending, refining and applying of the task. These elements are major components to help children learn the motor skills in physical education (Graham, 2001; Graham et al., 2007). Each skill as a task was extended to make it harder or easier based on children success in the overarm throwing skill. In this study most of the task modification took place during the second day in each week for the instructional programme. The ideas behind the extension



are that if children have a high rate of success for the task, they become motivated to perform the task, they might like the challenges to complete the task and they might practice more (Graham, 2001; Graham et al., 2007).

Children perform well when they know the outcome of their previous skill performance. For this reason, the researcher manipulated the, distance, and targets of throw to make it more challenging to the subjects. Distance from targets was short (5 feet) at the beginning of the instruction, then, it gradually increased (6, 8, 10 and 15 feet) to make the task harder and provided challenges for children. Target size was also manipulated from big to small size. The motor development literature supports the role of developmentally appropriate activities and the importance of task manipulations in teaching motor skills (Gallahue & Ozmun, 2006; Haywood & Getchell, 2009). Hastie & Saunders, (1991) stated that limited equipment pose as a barrier to opportunity to practices motor task in physical education settings. Although developmentally appropriate equipment were recruited for the motor skill programme, Esau Ofori Presby KG did not have any appropriate play ground for opportunities to practice physical activity. For this reason, an uncompleted building was utilized for the implementation of the traditional games instructional programme whenever the weather is favourable for pupils to play outside.

The results of this study strengthen the notion that effective instruction improves student performance. Lorson (2003) found that two groups of second-grade students who received 120 minutes of a biomechanical approach or critical cue approach to throwing improved their velocity scores from pretest to posttest. However, in contrast to the present study, Lorson (2003) did not find significant differences between his groups over

time. Stodden (2002) also reported that the kindergarten children improved from pretest to posttest, but no significant differences were found between the groups (biomechanical versus traditional) over time. The current study supports the existing literature that suggests that sufficient instruction and different instructional strategies results in improvements in overarm throwing skill. This finding supports that of Savage (2000) who stated that an effective early childhood motor skill programme brings about positive changes in the motor development of children.

#### **4.2.3 Effect of the Traditional Games Instructional Programme on Overarm Throwing Skill Scores by Gender**

Males had better ball scores ( $M=7.09$ ,  $SD= 1.38$ ) than females ( $M= 5.33$ ,  $SD= 1.45$ ) at the posttest. However, when one examines the findings relative to gender across the instructional programme, it was non-significant. Essentially, the gender differences that were present at the pretest persisted across the traditional game programme. These findings are similar to those by Lorson (2003) and Stodden (2002) who also found that gender differences persisted across their throwing instructional programme. It might be that the traditional games selected were not powerful enough for the girls to catch up with the boys as the differences between them from the start were small; however, after the traditional game instructional programme, the gap became bigger. The study findings through the interview with subjects also suggest strong environmental factors such as practice of throwing outside of school by most boys as a factor in gender differences. Although gender was present at the posttest, it is not clear what factors that accounts for these differences.

In all the subjects' performances of the targeted FMS (overarm throwing) improved. The researcher felt that the improvement would not have been present without her specific and explicit teaching of the key elements important for the proficient performance of each skill in the form of traditional games. Simply, practicing the skill without concern for the proficient form or correct technique does not enhance skill learning (Ashy, Lee, & Landin, 1988). Shephard and Godin (1986) found that children who had positive and enjoyable experiences when young were more likely to continue exercise into adulthood.



## CHAPTER FIVE

### SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to determine the effect of an 8-week selected traditional games instructional programme on kindergarten two pupil's overarm throwing skill performance. This chapter looked at the findings of the study, conclusion and recommendation for further research.

#### 5.1 Findings

The data collected on the KG2 pupils' overarm throwing performance before and after the instructional programme came out with the following findings;

1. It was found out at the pretest stage that most of the subjects selected for the research were throwing mostly at stages one and two but there was a significant improvement at the posttest stage where majority of the subjects were observed to be throwing at stages four and five respectively. Thus the selected Traditional games which involved throwing actions were found out to have helped to improve upon pupils overarm throwing skill performance. (M= 2.378, SD= 1.30 to M= 6.973, SD= 1.63)
2. This study also revealed that majority of the subjects used for this study were not able to exhibit the mature patterns of the overarm throwing skill especially at the pretest stage since most of them were not aware of their spatial body awareness as they performed the overarm throwing skill. Pupils were found to have improved

at the posttest stage. This finding demonstrates that fundamental motor skills for the sake of this research overarm throwing skills can be improved by using traditional games as an instructional strategy.

3. It was also observed that there was a significant difference between the pretest and posttest raw scores as collected by the TGMD-2 instrument on pupils' overarm throwing skill showing a moderate effect size of 4.59. This effect size can be attributed to the well designed developmentally appropriate motor instructional programme involving traditional games which was used to instruct the subjects for the eight week period.
4. Through the interview conducted by the researcher, it was found out that most of the female subjects used for this study did not have opportunity to practice fundamental motor skill both at school and at home. This might have accounted for their poor performance of the overarm throwing skill at the pretest stage.
5. The study also revealed that continuous opportunity given to children to practice skills in a form of play helps children to acquire fundamental motor skills easily through their constant interaction with their environment. Environmental conditions that include the opportunity given to children to practice skills, encouragement and instruction were found to be crucial to the development and improvement of overarm throwing skills among the kindergarten two (KG2) pupils.
6. It was also found out that gender difference was insignificant at the pretest stage for both male and female subjects but was significant at the posttest stage where

the males were observed to have outperformed their female counterparts both in the process and product measure of the overarm throwing skill performance.

7. For the product measure of the subjects overarm throwing, it was found out that there exists a significant difference between the male subjects product measure at the posttest stage since majority of them were able to hit the targets set though they were hitting the larger targets as compared to their female colleagues.
8. In general the researcher found out that, for majority of the subjects, developmentally appropriate instructional method such as traditional games are essential for improving their overarm throwing skill performance as observed from the posttest result of this study where majority of the subjects improved upon their overarm throwing skills.

These findings, therefore, have implications for school administrators, pre and in-service education of early childhood and lower primary teachers. Teachers need to develop skills in movement observation (Gallahue, 1996) as well as a repertoire of appropriate movement based learning experiences for their pupils especially at the early years of schooling.

### **5.1.2 Implications for Early Childhood Programmes and School Administrators**

1. School administrators should track down and monitor their pupils' motor development on a regular basis. This can be done by assessing the fundamental motor skills right from day one that the child will enroll in the school in order to identify any developmental delays that may exist in their motor skills development.

2. Early childhood programmes should provide developmentally appropriate and structured motor skill programmes for children.
3. Though Ghana does not have a specific standards for assessing fundamental motor skills, it is suggested that Policy makers in early childhood education should arrange their curriculum to include both structured and unstructured physical and motor skill activities to meet the objectives stipulated in the Kindergarten Physical Education Curriculum or to adopt the NASPE physical activity guidelines for children ages 0 to 5 (NASPE, 2009).
4. Kindergarten teachers should be trained through workshops or courses to be able to instruct their pupils using different instructional strategies in order to develop pupils' motor skill.

### **5.1.3 Implications for Physical Education Teacher Preparation Programmes**

1. Physical Education Teacher Preparation Programmes in the Ghanaian Tertiary Institutions should increase the number of courses related to child development, motor development and motor learning. This is because the researcher believes that if student-teachers who at the colleges of education who are potential basic and early childhood teachers are well equipped with adequate knowledge about motor behaviour of children, it will go a long way to enable them to design an effective curriculum and also be able to use developmentally appropriate instructional approaches in their everyday teaching of fundamental motor skills when they get to the field as teachers.
2. There is the need for the Physical Education Department of University of Education, Winneba and other Universities in Ghana who offer Physical Education to cooperate with the departments of Early Childhood to educate their students in the motor development

area especially at the early childhood level. Also, the student- teachers should be equipped with the necessary teacher preparation tools that will help them to better understand the motor behaviour of the pupils that they will be teaching in the near future.

3. Physical Education Teacher Preparation Programmes should be geared towards exposing potential physical education teachers to a variety of instructional approaches in teaching of fundamental motor skills.

#### **5.1.4 Implications for Kindergarten Teachers**

1. In-service training should be organized for Kindergarten teachers to brief them on the importance of motor skill development at the early childhood stage and its implication in future sports. They should be advised to structure and effectively use different instructional strategies to teach children basic motor skills.

2. Kindergarten teachers should coordinate with parents with regard to their children motor development and inform parents about their children development and progress in their motor skills on regular basis.

#### **5.2 Conclusions**

The study concluded that the overarm throwing skill performance among the selected thirty seven (37) subjects before the 8-week traditional games programme was significantly different from their performance after the programme; this means that the selected traditional games had a positive effect on the improvement of the overarm throwing skills among the subjects.

Furthermore, the improvement in their overarm throwing skills from pretest to posttest can be attributed to the traditional games selected which were overarm throwing



-oriented programme. These findings supported similar findings from the literature relative to different instruction and improvement in performance (McKenzie et al., 1998; Lorson, 2003; Stodden, 2002).

Subjects were also given enough practice trials which were all controlled by the researcher. Thus, the findings of this study support similar studies related to the effect practice and instruction has on overarm throwing (Halverson & Robertson, 1979; Lorson, 2003; Stodden, 2002). In this study, the subjects received practice and instruction on how to perform the overarm throw and thus it is not surprising that the effect size was moderate (4.05).

Gender differences existed in both process and product measure of overarm throwing, (Lorson, 2003; Robertson & Konczak, 2001). While examining individual constraints, this study reported that there were significant differences in overarm throwing experiences between genders with more boys reporting more experiences than girls.

### **5.3 Recommendations**

From the findings of this study, it is recommended that,

1. Teachers in the KG schools should be encouraged to incorporate traditional games in their physical activity lessons in order to make the acquisition and improvement of motor skills easier.
2. Teachers in the KG schools should be given the maximum opportunity to learn skills through different instructional approaches such as games which should form part of their teacher preparation programme.

3. Spaces should be created in all pre-schools and their environment to help them have enough opportunity to play so that they can learn fundamental motor skills.
4. Physical education teachers need to encourage children, specifically girls, to take part in and out of school activities. Both genders should have equal opportunities during school time to practice fundamental motor skill.
5. Physical education teachers should encourage parents to engage in throwing activities in a form of games with their female children at home, and they could give the children physical education homework (Example throwing a ball five consecutive times to hit a wall 5m away using the overarm throwing skill with the parents acting as supervisors) to be helped by their parents to perform it in order to promote throwing and other fundamental motor skills.
6. Initial teacher preparation programmes should focus on preparing teacher candidates who understand the technicalities of using different instructional strategies in teaching overarm throwing as a fundamental motor skill.
7. The researcher recommends that the course Lifespan Motor Development should be made compulsory in all Ghanaian Colleges of Education in order to keep the trainees abreast of the difficulties and challenges that the children they will be teaching in the real world faces in terms of motor skill acquisition and development.
8. Further research should replicate this study with a control and experimental groups and also by increasing the number of subjects and schools.

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APPENDIX A

PERMISSION LETTER FROM THE DEPARTMENT OF HEALTH, PHYSICAL  
EDUCATION RECREATION AND SPORTS



**UNIVERSITY OF EDUCATION, WINNEBA**  
**DEPARTMENT OF HEALTH, PHYSICAL EDUCATION,**  
**RECREATION AND SPORTS**

P. O. BOX 25, Winneba, Ghana. Tel: (05323) 22494 E-mail: [hpers@uew.edu.gh](mailto:hpers@uew.edu.gh)

Our Ref:  
Your Ref:

10<sup>th</sup> April, 2012

The Headmistress  
Larteh Esau Ofori Presby KG  
Larteh Akuapem

Dear Madam,

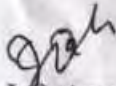
**INTRODUCTORY LETTER**

Miss. Regina Akuffo-Darko is an M.Phil student of the Department of Health, Physical Education, Recreation and Sports of the University of Education, Winneba. She is researching into: **“Improving Overhand Throwing Skill among Kindergarten Two (KG2) Pupils through selected Traditional Games”**.

I would be very grateful, if you could give her the necessary assistance to collect data for her research work.

Thank you.

Yours faithfully,

  
Prof. J. O. Ammah  
(HOD, HPERS)

## APPENDIX B

### Sample Interview Questions with pupils

In this section, questions were asked to the child. In order to gather the correct data without disturbing the child, questions were asked in a friendly atmosphere.

1) How many times have you been playing games both in school and at home?

.....

2) Do you throw objects at home during play time?

.....

3) Do you throw objects at school during play time?

.....

4) Do you have play grounds in your school and at home?

.....



APPENDIX C

**TEST OF GROSS MOTOR DEVELOPMENT-SECOND EDITION (TGMD- 2)**

**EXAMINER PERFORMANCE RECORD FORM FOR OVERHAND THROW SKILL**

<b><u>IDENTIFYING INFORMATION</u></b>					
Name of Subject _____	School _____				
Gender <input type="checkbox"/> Male <input type="checkbox"/> Female	Grade _____				
Date of Birth _____	Age _____				
Date of testing _____	Examiner _____				
<b><u>RECORD OF SCORES</u></b>					
<b>First Testing</b>			<b>Second Testing</b>		
Raw Score _____	Standard Score _____	Percentile _____	Raw Score _____	Standard Score _____	Percentile _____
Preferred foot <input type="checkbox"/> Right <input type="checkbox"/> Left <input type="checkbox"/> Not established			Preferred hand <input type="checkbox"/> Right <input type="checkbox"/> Left <input type="checkbox"/> Not established		
<b><u>Object Control Subtest</u></b>					
Skill	Performance criteria	Trial 1	Trial 2	Score	
Overarm Throw	1. Windup is initiated with downward movement of hand/arm				
	2. Rotates hip and shoulders to a point where the non-throwing side faces the wall				
	3. Weight is transferred by stepping with the foot opposite the throwing hand				
	4. Follow-through beyond ball release diagonally across the body toward the non-preferred side				
<b>Skill score</b>					

- Coding was done by the researcher observing the subjects performed the overarm throw and if any of the performance criteria appear in the subjects throw you award one(1) against that criteria and 0 score for absents of the performance criteria

APPENDIX D

THE TGMD-2 INSTRUMENT BY ULRICH (2000)



<b>TGMD-2</b>	<b>Test Of Gross Motor Development- Second Edition</b>	<b>Profile/ Examiner Record Form</b>																																																																															
<b>Section I: Identifying Information</b>																																																																																	
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Section VI: Subtest Performance Record						
Preferred Hand: Right <input type="checkbox"/> Left <input type="checkbox"/> Not established <input type="checkbox"/>						
Preferred Foot: Right <input type="checkbox"/> Left <input type="checkbox"/> Not established <input type="checkbox"/>						
<b>Locomotor Subtest</b>						
Skill	Materials	Directions	Performance Criteria	Trial 1	Trial 2	Score
1. Run	60 feet of clear space, and two cones	Place two cones 50 feet apart. Make sure there is at least 8 to 10 feet of space beyond the second cone for a safe stopping distance. Tell the child to run as fast as he or she can from one cone to the other when you say "go" Repeat a second trial	1. Arm move in opposition to legs, elbows bent			
			2. Brief period where both feet are off the ground			
			3. Narrow foot placement landing on heel or toe (i.e., not flat footed)			
			4. Nonsupport leg bent approximately 90 degrees (i.e., close to buttocks)			
<b>Skill Score</b>						
2. Gallop	25 feet of clear space and a tape or two cones	Mark off a distance of 25 feet with two cones or tape. Tell the child to gallop from one cone to the other. Repeat a second trial by galloping back to the original cone.	1. Arms bent and lifted to waist level at takeoff			
			2. A step forward with lead foot followed by a step with the trailing foot to a position adjacent to or behind the lead foot			
			3. Brief period when both feet are off the floor			
			4. Maintains a rhythmic pattern for four consecutive gallops			
3. Hop	A minimum of 15 feet of clear space	Tell the child to hop three times on his or her preferred foot (established before testing) and then three times on the other foot. Repeat a second trial.	1. Nonsupport leg swings forward in pendular fashion to produce force			
			2. Foot of nonsupport leg remains behind body			
			3. Arms flexed and swing forward to produce force			
			4. Takes off and lands three consecutive times on preferred foot			
			5. Takes off and lands three consecutive times on non preferred foot			
<b>Skill Score</b>						

4. Leap	A minimum of 20 feet clear space, a beanbag and tape	Place a beanbag on the floor. Attach a piece of tape on the floor so it is parallel to and 10 feet away from the beanbag. Have the child stand on the tape and run up and leap over the beanbag. Repeat a second trial	1. Take off on one foot and land on the opposite foot			
			2. A period where both feet are off the ground longer than running			
			3. Forward reach with the arm opposite the lead foot			
<b>Skill Score</b>						
5. Horizontal Jump	A minimum of 10 feet of clear space and tape	Mark off a starting line on the floor. Have the child start behind the line. Tell the child to jump as far as he or she can. Repeat a second trial.	1. A preparatory movement includes flexion of both knees with arms extended behind body			
			2. Arms extend forcefully forward and upward reaching full extension above the head			
			3. take off and land on both feet simultaneously			
			4. Arms are thrust downwards during landing			
<b>Skill Score</b>						
6. Slide	A minimum 25 feet of clear space, a straight line and two cones	Place the cones 25 feet apart on tops of the line on the floor. Tell the child to slide from one cone to the other and back. Repeat a second trial.	1. Body turn sideways so shoulders are aligned with the line on the floor			
			2. A step sideways with lead foot followed by a slide of the trailing foot to a point next to the leading foot			
			3. A minimum of four continuous step-slide cycles to the right			
			4. A minimum of four continuous step-slide cycles to the left			
<b>Skill Score</b>						
<b>Locomotor Subtest Raw Score (Sum of the 6 skill scores)</b>						

**Object Control Subtest**

<b>Skill</b>	<b>Materials</b>	<b>Directions</b>	<b>Performance Criteria</b>	<b>Trial 1</b>	<b>Trial 2</b>	<b>Score</b>
1. Striking a Stationary Ball	A 4-inch lightweight ball, a plastic bat and a batting tee	Place the ball on the batting tee at the child's belt level. Tell the child to hit the ball hard. Repeat a second trial.	1. Dominant hand grips bat above non-dominant hand			
			2. Non-preferred side of body faces the imaginary tosser with feet parallel			
			3. Hip and shoulder rotation during swing			
			4. Transfers body weight to front foot			
			5. Bat contacts ball			
<b>Skill Score</b>						
2. Stationary Dribble	An 8 to 10-inch playground ball for children ages 3 to 5; a basketball for children ages 6 to 10; a flat hard surface	Tell the child to dribble the ball four times without moving his or her feet, using one hand, and then stop by catching the ball. Repeat a second trial.	1. Contacts ball with one hand at about belt level			
			2. Pushes ball fingertips (not a slap)			
			3. Ball contacts surface in front of or to the outside of foot on the preferred side			
			4. Maintains control of ball for four consecutive bounces without having to move the feet to retrieve it.			
<b>Skill Score</b>						
3. Catch	A 4-inch plastic ball, 15 feet of clear space and tape	Mark off two lines 15 feet apart. The child stands on one line and the tosser on the other. Toss the ball underhand directly to the child with a slight arc aiming for his or her chest. Tell the child to catch the ball with both hands. Only count those tosses that are between the child's shoulders and belt. Repeat a second trial	1. Preparatory phase where hands are in front of the body and elbows are flexed			
			2. Arms extend while reaching for the ball as it arrives			
			3. Ball is caught by hands only			
<b>Skill Score</b>						

4. Kick	An 8 to 10-inch plastic playground or soccer ball; a beanbag; 30 feet of clear space and tape	Mark off line one line 30 ft away from a wall and another 20ft from the wall. Place the ball on top of the beanbag on the line nearest the wall. Tell the child to stand on the other line. Tell the child to run up and kick the ball hard toward the wall. Repeat a second trial.	1. Rapid continuous approach to the ball			
			2. An elongated stride or leap immediately prior to ball contact			
			3. Nonkicking foot placed even with or slightly in Back of the ball			
			4. Kicks ball with instep of preferred foot (shoe-laces) or toe.			
<b>Skill Score</b>						
5. Overarm Throw	A tennis ball; a wall, tape and 20 feet of clear space	Attach a piece of tape on the floor 20 feet from the wall. Have the child stand behind the 20 foot line facing the wall. Tell the child to throw the ball hard at the wall. Repeat a second trial	1. Windup is initiated with downward movement of hand/arm			
			2. Rotates hip and shoulders to a point where the non-throwing side faces the wall			
			3. Weight is transferred by stepping with the foot opposite the throwing hand			
			4. Follow-through beyond ball release diagonally across the body toward the non-preferred side			
<b>Skill Score</b>						
6. Underhand Roll	A tennis ball for children ages 3 to 6; a softball for children ages 7 to 10; two cones; tape and 25 feet of clear space	Place the two cones against a wall so they are 4 feet apart. Attach a piece of tape on the floor 20 feet from the wall. Tell the child to roll the ball hard so that it goes between the cones. Repeat a second trial	1. Preferred hand swings down and back reaching behind the trunk while chest faces cones			
			2. Strides forward with foot opposite the preferred hand towards the cones			
			3. Bends knees to lower body			
			4. Releases ball close to the floor so ball does not bounce more than 4 inches high.			
<b>Skill Score</b>						
<b>Object Control Subtest Raw Score (sum of the 6 skill scores)</b>						

**APPENDIX E**

**SUMMARY OF TOTAL BODY MANIPULATIVE DEVELOPMENTAL STAGES**

<b>Fundamental Motor Skills</b>	<b>Stage 1</b>	<b>Stage 2</b>	<b>Stage 3</b>	<b>Stage 4</b>	<b>Stage 5</b>
<b>Overarm Throw</b>	<i>Chop</i> Vertical wind-up “Chop” throw Feet stationary No spinal rotation	<i>Sling Shot</i> Horizontal wind-up “Sling shot throw” Block rotation Follow through across body	<i>Ipsilateral Step</i> High wind-up Ipsilateral step Little spinal rotation Follow through across body	<i>Contralateral Step</i> High wind up Contralateral step Little spinal rotation Follow through across body	<i>Wind Up</i> Downward arc wind up Contralateral step Segmented body rotation Arm-Leg Follow through





**SAMPLE LESSON NOTE**

School: Esau Ofori Presby KG

Discipline: Traditional Game

Class: KG 2B

Weekending: 13<sup>th</sup> -17<sup>th</sup> February, 2012

Date/Day: Tuesday, 14<sup>th</sup> February 2012

Event: (Prapra wo fi) Clean Your House

RPK: Pupils have been throwing objects such as stones and oranges

Objectives: By the end of the lesson, pupils will be able to throw at least ten balls within 15 minutes to their opponents’ territory

Duration/Time: 30minutes

Number on Roll: 37

Apparatus: thirty seven socks balls, rope a clear space

Average Age: 5yrs 6months

Lesson Focus	Type and Description of Activity	Teaching Points	Formation/Apparatus	Remarks
Set Induction	Ask pupils to mention what they do when they want to pluck mango from a tree		In a horse shoe formation	
General Warm Up	Lead pupils amidst singing to imitate the movement of trees and birds as they move freely around the demarcated area	1.Move like a bird 2.Move like a tree	-Free-	
Stretching	From free, pupils swing arms up and downwards across the body	1.Swing arms up, down and across body	-Free-	
Specific Warm Up	From free, pupils swing arms up and sideways at shoulder width apart	1.Swing arms up and sideways	- Free-	
Main Content	In two groups with each group in their part of the field. Give a ball to each pupil and on signal guide them to throw all balls and those that will land in their “house” to their opponents territory	1.Step forward with your non throwing leg before you throw 2.Use overarm throwing skill only 3. Stay at your side of the field and do not cross the rope	<pre> * * *      ↑      * * * *          * *             * * * * *          *                     </pre>	
Culminating Activity	Let pupils throw the balls 3minutes and stop the activity and count the number of balls at each side. The	1.Balls thrown without a step will not be counted 2.throw as hard as you can	Two groups with a rope demarcating the field	

	group with fewer balls wins the game.			
Closure	Let pupils walk around the field	Walk as fast as you can	- Free-	



**SAMPLE LESSON NOTE**

School: Esau Ofori Presby KG

Class: KG 2B

Weekending: 6<sup>th</sup>-10<sup>th</sup> February, 2012

Date/Day: Wednesday, 8<sup>th</sup> February 2012

Duration/Time: 30minutes

Number on Roll: 37

Apparatus: Thirty seven oranges, rope a clear space





Average Age: 5yrs 6months

Discipline: Traditional Game

Event: Ole

RPK: Pupils have been throwing stones at lizards and other animals

Objectives: By the end of the lesson, pupils will be able to throw at least ten balls into the basket placed in front of him or her.

Lesson Focus	Type and Description of Activity	Teaching Points	Formation/Apparatus	Remarks
Set Induction	What do you normally do when you see lizards on the walls?		- Free -	
General Warm Up	Picking Tails: Let pupils hang a tail at their back and on command, let them pick as many tails as they can from their colleagues whilst they prevent their tails from being picked	1.Jog around the demarcated area 2.Pick as many tails as you can 3.Dodge to prevent your tail from being picked	- Free -	
Specific Warm Up	Lead pupils to stretch by imitating movement of birds	1.Swing the arms forward and backwards 2.Lock the elbows	- Free -	
Main Content	<b>Activity I:</b> Put pupils into groups and let them stand in rows facing baskets <b>Activity II:</b> Draw a line 6m across the front of the rows <b>Activity III:</b> On command let the first person in each group throws his or her ball into the basket and continues till each person in the group has had his or her turn. <b>Activity IV:</b> Repeat the same activity but this time increase the distance	1.Place non throwing foot on the starting line 2. Let side face the basket 3.Keep eyes focused on the basket 4.Swing hands from behind 5. Follow through with your throwing hands to the non throwing leg.	Line facing a basket 6m in front of the first thrower **** →  **** →  **** →  **** → 	

Culminating Activity	Same as above but count the number of balls in each basket. The group with the highest number of balls wins.	- Same as above-	In groups with a basket in front of the group - Same as a bove-	
Closure	Let pupils walk around working area	Walk briskly	- Free-	

