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**Speed, Strength and Endurance Training for Adolescent Footballers in Kenya**

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<p>The subject of this thesis was speed, strength and endurance training for adolescent footballers in Kenya. The commissioner of this work was the Football Kenya Federation (FKF). Football is a popular sport in Kenya, but the development of football in Kenya has been ineffective due to poor coaching standards, lack of information and inadequate facilities. This has also resulted in Kenya being able to produce few world class footballers. The purpose of this thesis was to provide easily accessible information to upcoming coaches in Kenya by developing a booklet that could be distributed to coaches. The booklet provides information on speed, strength and endurance training for adolescent footballers in Kenya.</p> <p>The standard of football in the world is improving. Professional players in several European leagues earn big salaries. The ultimate dream for most footballers is to one day play professionally for teams such as Barcelona FC or Real Madrid. To have a chance to achieve such dreams, players need to be talented, work hard and have good coaching from an early age. Speed, strength and endurance are key qualities that every professional football player should possess.</p> <p>The booklet, which is a product of this thesis, gives theoretical background information on how to train speed, strength and endurance. The booklet also provides drills and exercises that can be used to develop these three aspects as well as providing information on how to test each of them.</p> <p>Previous research has shown that speed, strength and endurance training can be effectively implemented for adolescent footballers. Speed and endurance training are the two aspects that do not require many facilities. However, strength training is more challenging without facilities such as a weight room, but it can also be trained effectively in Kenya by using some basic strength developing exercises.</p> <p>This booklet has been made specifically for the Kenyan environment. As a result, the limited facilities available to most adolescent footballers in Kenya dictated the drills and exercises that are included in this booklet.</p>	
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## PREFACE

“Life is a soccer game. The referee is God, the parents are on the sidelines cheering you on, the defenders are your obstacles, your teammates are your best friends, the goals are your ambitions, your missed shots are your failures, and breakaways are the happiest times in your life. You have to learn to predict the next play before it happens. Just remember to always keep your head up and shoot for your goals.” –unknown-

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## ABBREVIATIONS

FIFA	Federation Internationale de Football Association
FKF	Football Kenya Federation
CAF	African Football Federation
ANC	Africa Cup of Nations

## 1 INTRODUCTION

According to Sammy Sholei, the Vice Chairman of (FKF), and a former national team football player, physical fitness training has largely been overlooked by football coaches and trainers in Kenya due to lack of knowledge and easy accessibility of information. Coaches lack information on effective speed, strength and endurance training (Sholei, 2011). As a result of this, speed, strength and endurance were chosen as the three physical qualities on which to focus in this thesis because they are all important qualities in the development of world class football (Ogolla, 2012).

The purpose of this thesis was to produce an informative booklet for the FKF. The aim of it was to provide easily accessible information to upcoming coaches in Kenya. The booklet focuses on speed, strength and endurance training for adolescent footballers in Kenya. Specifically it provides information on how to safely and effectively train for the three qualities and also how to test them. From a student point of view the aim is to gain a deep understanding of speed, strength and endurance training for adolescent footballers.

The goal was to gather theoretical information on speed, strength and endurance which were then used to compile an informative booklet for the FKF, a body responsible for the running of football in Kenya. The booklet would then be used in the future by the youth football coaches in Kenya to impart speed, strength and endurance training programs for their upcoming players. A lot of information is available online and in books on physical fitness training for footballers but many of the coaches in Kenya do not have access to the internet or the books (Sholei, 2011). Therefore, this booklet would provide an immediate solution to the problem of lack of information. The idea was not to exhaust the subjects but rather to provide basic clear and straight forward information that would easily be understood and implemented even in the harshest conditions and with limited available resources. That also allowed the accomplishment of this task in the given timeframe and with the available resources.

According to John Bobby Ogolla, one of the best players that Kenya has ever produced, and presently the assistant coach of one of Kenya's biggest football clubs, Gor Mahia FC, speed, strength and endurance are critical aspects in football. With the correct training methods, these qualities could be improved greatly. However, it is important to take into consideration the physical development of an adolescent in order to make the training more effective and

safe. At the same time, it is necessary to keep in mind the extreme conditions and limited facilities that coaches in Kenya deal with (Ogolla, 2012).

Since my early childhood, football has been part of my everyday life, from playing as a toddler with my brother, to playing competitively in my teenage years and most recently to working as a trainer for a professional football club. This passion for football is a key factor that motivated me to write this thesis on the topic: I would like to gain a deep understanding of speed, strength and endurance training because, in the future, I intend to pursue a career as a trainer for adolescent footballers.

The key learning goal that I set was to understand how speed, strength and endurance training could be attained during adolescence in the Kenyan environment. Understanding these qualities would be an important step in my professional development. Through this work, I have gained valuable knowledge that will enable me to instruct adolescent footballers better, which will aid me in future when looking for employment opportunities in the world of football.



## 2 FOOTBALL

According to the Oxford Advanced Learners Dictionary football is “a game played by two teams of 11 players, using a round ball which players kick up and down the playing field.” Football is generally accepted as one of the most popular sports in the world. According to official FIFA figures, the 2010 World Cup in South Africa had a TV audience of over 3.2 billion people which is roughly 46.4% of the global population and it was broadcast in every single country. These figures show that football is more than a sport; it is like a religion to its most passionate followers (FIFA, 2011).

Over the decades, football has played a big role in the world we live in by starting wars, caused ceasefires, and changed the lives of millions of people. Wars have been fought because of football. The most famous example of this is the four day war between El Salvador and Honduras. El Salvador beat Honduras to progress to the World Cup finals and this triggered a four day war between the two countries. Football has also halted wars as was the case when Nigeria and The State of Biafra had several days of ceasefire so that people could go and watch Pele play, one of the best Brazilian players of all time (Eskola 1998, 30). These are just a few examples of how big a role football plays in the world and this takes us to the question: What kind of a sport is football?

### 2.1 The Analysis of Football

Football is a very demanding sport. No one is born a complete footballer no matter how gifted or talented one may naturally be. It is important to understand the physical and mental requirements needed to become a top player. Football players must have excellent endurance, be strong, fast, skillful, technically good, have the ability to be good team players, be mentally tough and finally be able to tactically adapt to the strategies and styles of play that the coach expects from them (Ogolla, 2012).

#### 2.1.1 Physical Qualities

Speed is an aspect of football that should not be overlooked. It is explained as the ability of a player to move from one point to another on the football pitch as fast as possible (Gatz 2009, 6). It is closely tied with skill and also with strength because strong and healthy muscles are required for an individual to be fast. But being fast is not enough, a player must be fast and at the same time he or she needs to be skillful enough to be able to control the ball

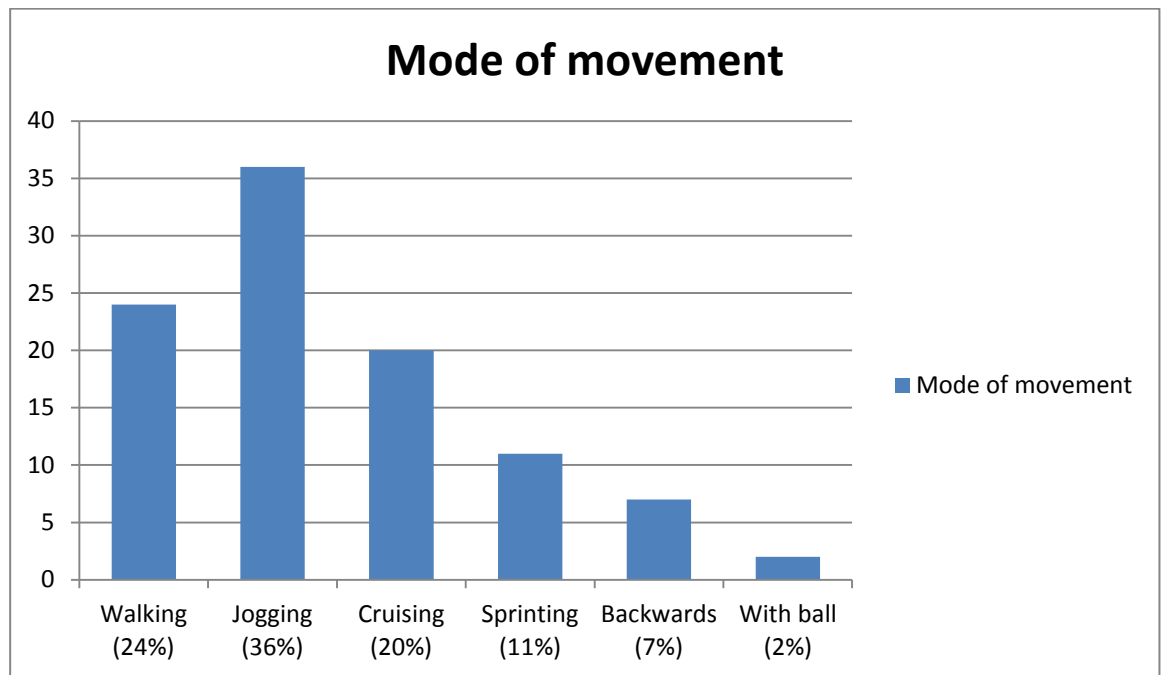
and make a good decision with what to do with it. If a footballer is fast, they can control the ball at high speed and make correct decisions, then that is a good player (Ogolla, 2012).

Speed and its importance depend a lot on the position of a player in the field. A goalkeeper or a central defender might not require as much speed as a striker and can make up for the lack of speed with good positioning. For strikers and also for wing players', speed is a great asset and also a critical attribute. In order for the striker to get behind the defensive line, the player needs to be fast. On the wing, a player needs to be fast to be able to beat the defender and cross the ball into the penalty box. Therefore, speed plays a big role in football and coaches prefer fast players in their teams (Ogolla, 2012).

Strength is an important factor in football. A footballer who is physically strong has an advantage over a weaker competitor (Ogolla, 2012). Strength is the force of a muscle generated during a contraction (Quinn, 2012). Simply lifting weights with the traditional "3 sets of 10 repetitions" is not an effective way to train strength for a footballer. Football requires a balance of explosive power and muscular endurance. Some players may benefit from increasing their lean mass but even they should focus on converting much of their strength into football specific power (Ogolla, 2012). Strength is an important factor when shielding the ball, tackling, jumping, shooting, passing and can also play a role in how fast a player is (Kirkendall 2011, vi).

Endurance is an aspect that is important in almost all sports. Even in sports such as golf a player with good endurance can focus and perform better at the end of his or her golf round compared to one whose endurance is not as good. Endurance in sports can be defined as the ability or strength to last despite the fatigue, stress or other adverse conditions (Quinn, 2012). In football, endurance is one of the most important physical attributes that a player must have. A football game lasts for 90 minutes and the professional players cover an average distance of approximately ten to fourteen kilometers during the game. These ten to fourteen kilometers consist of approximately 24% (22 minutes) walking, 36% (32 minutes) jogging, 20% (18 minutes) cruising or striding, 11% (10 minutes) sprinting or an all out activity, 7% (6 minutes) moving backwards and 2% (2 minutes) while in possession of the ball (Reilly 2007, 20). These numbers indicate that endurance is important for a football player. However, they also indicate that football is a game where the pace of moving changes constantly from a walk to all out sprinting and this must be considered when planning endurance training sessions for football players.

Table 1. A player's movement on the field during a 90 minute game.



### 2.1.2 Team Player

Along with skill, another sign of a good player is that he makes the players around him look good. In football, the ability to be a good team player is very important. With eleven players in a team, each of them must understand their tasks. A defender must do his task and the midfielders and strikers must do theirs. Being a good team player is easier for some than for others. It has a lot to do with the personality of a person, his previous experiences, the coaching he receives, his teammates and the cohesiveness of the team (Ogolla, 2012).

### 2.1.3 Mental Toughness

Mental toughness in football is the ability to perform well when under a lot of pressure or in difficult circumstances such as at the end of the match. Confidence and mental toughness usually go hand in hand in sports. If a player is mentally strong and can handle a lot of pressure, then he is very confident. Mental toughness and confidence are elements that often develop with time. Especially, young players need to be treated with a lot of respect and should be encouraged because they might be unsure of their own abilities. Mental toughness is an important part of football because there is always pressure on a footballer to perform (Ogolla, 2012).

#### 2.1.4 Tactical Awareness

Tactical awareness in football has everything to do with the placement, movement, passing, possessing and controlling the ball. It is an aspect of football that can be very difficult for an individual to learn without proper coaching. Unlike skill, which can be practiced by an individual alone, tactical awareness is something that can only be learned by either watching or by being coached. Another challenge is that every coach has a different coaching style. It is important for a footballer today to be able to adapt to different tactical set ups that the coach may come up with. Some coaches are known for a more offensive game style while others prefer to play more defensively. Tactical awareness develops with experience and watching the sport (Ogolla, 2012).

#### 2.1.5 Overview

Speed, strength, endurance, skill, technique, mental toughness, team play and tactical awareness are all important qualities when thinking about the best football players. They should all be stressed and imparted by coaches (Ogolla, 2012). However, this thesis focuses only on three of these aspects which are speed, strength and endurance. The reason is that these qualities are the most frequently overlooked by coaches in Kenya, probably because of a lack of understanding, which is as a result of lack of information on their importance (Sholei, 2012).

### 2.2 Football in Kenya

Kenya is similar to most other African countries in that Kenyans love football. However, Kenya has never been considered a strong football nation because of its poor performances at the International Level. It has managed to qualify for the Africa Cup of Nations (ANC) five times, but the team's results in the tournament have always been poor. This has resulted in people asking: What is wrong with Kenyan football? There are two possible answers to this. First, the management and the organization of football in Kenya is poor and extremely corrupt. Secondly, the coaching standards and facilities available to players are limited. The corruption and the mismanagement have certainly been a factor for Kenya's having such poor facilities because the money provided by FIFA and the government has not been used for its intended purposes (Sholei, 2011). Since there is not much that an individual can do about the corruption, it is important to focus on the coaching aspect because that is a sector that can be influenced.

Kenya does not have a structured coaching program. This means that individuals who have a desire to be coaches find it very challenging to get the required and up to date training. FKF in conjunction with African Football Federation (CAF) does organize courses for coaches so that they can get higher coaching certificates but these are short courses and randomly organized. As a result, there are very few qualified coaches in Kenya. The lack of professional coaches means that the youth are not getting the best possible guidance, a big reason why Kenya is not producing as many talented young players as some West African countries. In order for the football standards in Kenya to improve, the country needs to have coaches who are better trained so that they can nurture the young talents into high calibre international players in future (Sholei, 2011).

According to Mr. Francis Kimanzi, the former national team head coach and the current National Technical Director of Football, Kenya has less than 10 coaches who are licensed. The licensed coaches generally work for the teams in the top division. Generally, amateurs or former players who have limited coaching knowledge, deal with youths and the adolescent footballers in the country because of the lack of professional coaches (Kimanzi, 2012). Sholei says that the condition of youth football in Kenya is very poor. With no organized youth systems and structures in place, it has become extremely challenging to produce highly talented young footballers. Kenya needs to have a system of training coaches if it wants to improve its standards of football. The training of coaches is a long term goal that the federation must sort out. Furthermore, as a short term goal, an informative booklet that can easily be distributed to coaches has been availed as the first step to ensuring that the individuals who work with adolescent footballers have at least some theoretical background information on which to base their coaching (Sholei, 2011).

### 3 ADOLESCENCE

The word adolescence is derived from the Latin verb *adolescere* meaning “to grow up.” As such, adolescence is the transitional stage of development between childhood and adulthood (Hornby, 2005). The range of ages between which one is considered to be an adolescent varies slightly by culture but generally, adolescence begins around age 13 and ends around age 18. The adolescence is a time during which many changes occur in a person’s body (The Growing Child, 2012). During the adolescent years, most youths go through the physical stages of puberty.

#### 3.1 Puberty

Puberty is referred to as the process by which a youths body matures into an adult capable of sexual reproduction (Hornby, 2005). Puberty marks the beginning of adolescence but it does not end at the same time. It ends well before an adolescent is considered an adult. It is important to note that different people reach puberty at different ages. Therefore, simply because two individuals have the same age does not mean that they are at a similar maturity level (The Growing Child, 2012). Factors that can affect early or late maturity are genetic, nutritional and eating disorders (Delayed Puberty, 2011).

#### 3.2 Growth

The most important changes regarding speed, strength and endurance training are the changes and development that occur in the musculoskeletal system. An important change that happens as a result of musculoskeletal growth and development is that the growth cartilages are active and weakened. Therefore, the growth cartilages are vulnerable to injury during adolescence. Most of the injuries related to growth occur during the peak height velocity because of the mismatch in bone and muscle growth. Adolescents generally experience rapid growth during adolescence years and for the boys this growth is approximately 28cm while for the girls it is approximately 25cm. For boys the growth spurt begins a few years later than for girls. The tempo and the onset of growth differ between individuals. Therefore, as a result of these developments and changes that occur in the musculoskeletal system, the adolescent athletes are at a particularly high risk of injury (O’sullivan, 2007).

### 3.3 The Brain

However, the changes that occur during adolescence are not only physical changes. Studies have shown that adolescence is a period of rapid brain development and maturation. During this time the cognitive control of emotions, social skills, memory, timing of motor and cognitive sequences', reasoning and decision making all improve rapidly. These are all important tools when considering the development of an adolescent, be it in sports or otherwise (O'Sullivan, 2007).

### 3.4 Sensitivity Periods

During adolescence, it is important to train specific qualities at specific ages because, at a certain age, an individual can best learn and improve certain qualities. At age 13, the main emphasis should be on speed and speed related strength training. At ages 14-15, the main emphasis should be on speed, strength and aerobic endurance training. At ages 16-17, the focus should be on speed strength and aerobic endurance training. Finally at ages 18-19, the main focus should be on aerobic endurance, speed endurance and maximal strength training. These age ranges give an indication of what the training should be like for adolescents at different age levels. However, it is important to keep in mind the different maturation speed in individuals and therefore going strictly by age can be misleading (Ogolla, 2012).

Speed is a quality that is largely hereditary however, it can effectively be developed if speed training is started at an early age and the sensitivity periods are taken into consideration. There are factors that determine how fast an individual can be including the nervous system, skill and strength levels. Before adolescence, it is particularly important to train the aspects of speed that deal with the nervous system such as stride frequency, reaction time and rhythm. Strength is an important factor when considering the speed of an individual, but strength training should not be emphasized until the sensitivity period for strength is reached (Hakkarainen, Jaakkola, Kalaja, Lämsä, Nikander & Riski 2009, 141).

Strength training for pre-adolescent footballers should focus on exercises that improve muscle coordination and on learning the correct techniques for strength training exercises. Good muscle coordination enables the footballer to use the muscular strength in sport specific movements such as kicking and shielding the ball. At the early stages of adolescence, it is important to focus the training on the muscles aerobic endurance. Movements done using own body weight and high number of repetitions should be the focus because this kind of

training builds a solid foundation for heavy strength training in the later stages of adolescence (Hakkarainen et al. 2009, 141-142).

Endurance training is important for adolescent footballers. Endurance training in early childhood and during the early stages of adolescence is essential for building a strong base on which to plan endurance training later on (Hakkarainen et al. 2009, 142). During the early stages of adolescence the footballer's body has the ability to recover effectively from short exercises lasting less than ten seconds. In short exercises the lactic acid levels do not significantly increase. However, since the body's ability to get rid of lactic acid has not fully developed, the exercises that build high lactic acid levels should be avoided. At the later stages of adolescence, it is important to include endurance exercises that build high lactic acid levels in the body (Miettinen 1999, 209-210).

### 3.5 Adolescence Overview

As a result of these changes that happen in a person's body during adolescence it is important to understand how to train properly in order to avoid injuries and also to attain maximum benefits from the training. If the stress that is exerted on a certain muscle or joint in a certain exercise is very specific and high, this can lead to stress fractures and pain. Too specific and heavy training should be avoided at the early stages of adolescents because a body that is maturing cannot withstand the same kind of load that an adult body's can (Hakkarainen et al. 2009, 207-208). Therefore, when adolescent footballers are training for speed, strength and endurance, it is important to keep in mind the changes that occur during adolescence.



## 4 SPEED, STRENGTH, ENDURANCE AND SKILL

Speed, strength and endurance are three important qualities for all good football players. Skill is an aspect that must always be considered simply because without skill the other qualities matter very little. As such, speed, strength and endurance training were analyzed in this thesis.

### 4.1 Speed

According to Rex Hazeldine, "Fitness for Sports," speed plays an important role in the majority of sports, even though the actual nature and function of the speed varies. Maximum running speed is critical for sprinters as well as for wingers in a number of field games such as football (Hazeldine, 2000,112).

The basic idea in speed training is the contraction and relaxation of a certain muscle as fast as possible. Rhythm here is critical because the muscle must be able to relax very quickly after the contraction. When training for speed, the interaction between the muscles and the nervous system must be considered seriously. A good running technique is also important because it not only allows the player to run fast but also to use less energy while running (Mero, Peltola & Saarela, 1987, 17-19).

Kimanzi states that in football, the speed training should be considered from the point of view of how fast a player can handle the ball and also take into consideration the position of the opponents and teammates. The absolute maximum speed in football is reached only for short moments (Kimanzi, 2012). High maximum running speed is still important in football because if a player is slow, it is difficult to develop sport specific speed (Hakkarainen et al. 2009, 219).

Speed is one of the most difficult physical qualities to develop. The speed of an individual is determined, to a large extent, by the individual's genetic background and physical activities during early childhood. From between the ages of 5-11, the running speed develops evenly at roughly 3-4% per year (Hakkarainen et al. 2009, 220).

Coaching speed for footballers who are in the early stages of adolescence can be difficult. For each exercise, the level of performance should be very high, the focus of the player should be good and the recovery complete (Mero, Nummela, Keskinen & Häkkinen 2007, 297). This can be difficult when working with young footballers because their focus is rarely

absolute and they are not patient enough to wait for complete recovery. Normally by the age of 14 these challenges decrease because the footballer starts to understand better the importance of focus and recovery (Hakkarainen et al. 2009, 220).

Speed can be divided into five different categories that are all important when planning a training program for an adolescent footballer. The first is basic speed, which is the ability of the muscular nervous system to function quickly. This is not sport specific and often it is considered to be a genetic trait that will lay the foundation for sport specific training (Hakkarainen et al. 2009, 222). The second is reactive speed, which is measured by how quickly an individual can react to a stimulus. For example, in sprints it is the amount of time it takes for the athlete to produce movement after the gun goes off (Miettinen 1999, 58). The third example is the explosive speed, which means a single and as fast a movement as possible, for example, the jump off in a long jump or high jump event. The fourth is moving speed, which is the top running speed, for example, over a distance. The fifth and final category is speed skill and this is sport specific. This describes the ability of a player to handle the ball, to see the opponents, teammates and to make tactically good decisions (Miettinen 199, 197-198).

#### 4.1.1 The Basics for Speed Training

When training for speed, it is necessary for the individual to be moving at the extremes of his own speed ability if positive results are desired. He should do all the training at a maximal effort. The effectiveness should be close to 100% all the time and in some instances it can be over 100%, for example, when doing downhill sprints also called supraspeed drills. The individual exercises should not last over 10 seconds because it takes the body about 5-7 seconds to start producing lactic acid, which will decrease the muscles effectiveness to work. Therefore, the recommended speed drill should last between 1-6 seconds. The recovery should be absolute and the next exercise should start when the footballer has fully recovered. When talking about adult footballers, the recovery time should be 2-10 minutes. However, for adolescent footballers this recovery time can be shorter because they cannot produce a maximal effort and, therefore, 30 seconds to 1 minute should be enough. But a coach must keep a close eye on the training and adjust the recovery times if needed. The number of repetitions in an exercise should be 5-20 times. The younger the footballer is, the more repetitions he should do. For example, top footballers cannot produce many maximal repetitions in a single training session. Motivation is an important aspect when training for speed.

With younger footballers, it is good to use competitive games and relays as motivation but for older individuals, verbal motivation is enough (Hakkarainen et al. 2009, 223).

Important factors to consider when talking about speed training are reaction time, rhythm, frequency, speed strength, skill, mobility, elasticity and relaxedness. Speed and its different aspects should be developed throughout childhood and adolescence. However, there are certain aspects that should be considered in relation to the age of an individual. Reaction time can be developed throughout the lifespan of an individual. The fastest improvements can be seen at the early stages of adolescence because this is a time when a person's brain develops rapidly. In order to take advantage of this, the coach should include exercises that improve reaction time during the early part of adolescence (Hakkarainen et al. 2009, 224-227). Rhythm develops best during childhood but can also be developed at a later age. Frequency should also be trained in childhood and especially before adolescence (Miettinen 1999, 199). Speed strength can be trained by jumps and throws in younger footballers but it should be more focused in footballers who are at a later stage of adolescence or past puberty because that is the best time to do maximal strength training which plays a critical role in speed strength development. Speed strength training should be sport specific. Relaxedness is an important factor when coaching children and adolescents and it should be incorporated into all speed and skill training. Finally, elasticity should be considered carefully during the growth spurt because heavy jumping drills can cause some health risks due to the mismatch of bones and muscles (Hakkarainen et al. 2009, 224-227).

The early stages of adolescence are particularly important for coordination, rhythm, frequency, and elasticity in speed training. During these stages of adolescence, games and relays should still be a vital part in the training of footballers when considering speed. Some sports specific drills should also be included (Mero et al. 2007, 300-302). As the body matures it is possible to push it more and more and, the loading can slowly be increased. During the growth spurt, a lot of emphasis should be based on the frequency and rhythm. Speed strength training should be more emphasized towards the end of adolescence (Hakkarainen et al. 2009, 230).

After age 15, or when puberty is over, speed can be trained just as it would in adults. Meaning that repetitions should be decreased, recovery times should be increased and there should be a lot more sport specific training in regards to speed. All the different aspects of speed can still be developed at this stage even though it might not be as easy. For example,

stride frequency and muscle coordination training can be much harder at the latter stage of adolescence. At this stage, speed training should be diverse and very sport specific (Hakkarainen et al. 2009, 230)

The majority of speed training should be done during the pre-season because it involves a lot of strength related work but since speed training focuses more on the proper technique rather than tiring the muscles, it can and should be done during the in-season. It is good to combine agility training with speed training because both are fundamental parts in the game of football (Ogolla, 2012).

The different aspects of speed should be trained from early adolescence because the nervous system can be affected best during childhood. Speed should be trained as diversely as possible within the environment; exercises and stimulus changing as much as possible. In conclusion, it is important to train all the different aspects of speed throughout the childhood and adolescence. However, frequency, rhythm, reaction speed and skill should play a bigger role during the time before puberty. As the child enters puberty and begins to mature the emphasis should be based more and more on elasticity and speed strength (Hakkarainen et al. 2009, 231-235).

#### 4.1.2 Speed Training in Kenya

Speed training in Kenya is not as challenging as strength training in Kenya because speed training does not require advanced facilities. With a timer and space to run, speed can be developed and therefore, the only main concern that arises is how well the coaches can instruct speed training exercises for their players. Just as with strength and endurance, the lack of professionalism in football coaching means that very few adolescent players get the right kind of training. With some basic background knowledge and examples, the coaches can very easily adopt drills and exercises into their training programs that will make their players faster (Sholei, 2011).

#### 4.2 Strength

Strength can be described as the muscles ability to generate force. Strength training is the method used to develop muscular strength by steadily increasing the ability to resist force (Hazeldine 2000, 71). Its sessions are designed to place higher and higher resistance on the muscles, which in turn stimulates the development of muscle strength to meet the added

demand. Strength training is a critical part of every footballer's training program (Hazeldine 2000, 73). It is important because it makes the footballer stronger which in turn makes him faster and less susceptible to injury (Kirkendall 2011, 6).

Strength training is one of the trickiest aspects of fitness training for adolescent footballers because there are several things that must be taken into consideration. As mentioned in the chapter on adolescence, this is a time in a person's life when there are many changes occurring in the body and, therefore, the adolescent is more prone to injury than an adult. When talking about strength training especially for adult footballers and for experienced adult footballers, heavy weights are a central part of their training program. However, with adolescents this should not be the case. There is no doubt about the benefits of strength training for adolescents, but the training must be carefully planned and monitored in order to avoid injury. Learning the proper techniques for the different lifts and exercises should be the first step and only after that should the footballer start to add weights (Hakkarainen et al. 2009, 197-198). At the early part of adolescence, the best way to train for strength is to use exercises that use the person's own body weight and only after puberty should he start using other weights (Miettinen 1999, 60).

One way to look at strength training is to divide it into three main categories. These three categories are: maximal strength training, strength endurance training and speed strength training. It is necessary to consider all these aspects of strength training because their methods vary greatly. However, they are all necessary parts of successful strength training programs (Mero et al. 2007, 251).

#### 4.2.1 The Basics for Strength Training

Maximal strength training can be divided into two categories: nervous and hypertrophy. In the maximal strength training that focuses on the nervous system, the main emphasis is on building the nervous system's ability to activate muscle fibers. The resistance and weight in this kind of training should be maximal. The number of repetitions should be 1-4 times. The recovery in this kind of exercise must be complete between sets, meaning that the individual must be able to do a maximal set after resting. Maximal strength training that is based on hypertrophy aims to increase the muscles cross sectional surface area and by doing that the muscles maximal ability to contract. The resistance should be 60-80% of the maximal load. The number of repetitions should be 5-15 times. In this case, the recovery between

sets should be maximal as well (Hakkarainen et al. 2009, 204). All maximal strength training can be dangerous for adolescents because of the high loads that it places on the body that is still developing and must be used only with caution and under supervision. However, it is important to note that it does produce strength in adolescents even though it is at its most effective only after hormonal maturity has been reached (Miettinen 1999, 202).

When looking at strength from an endurance point of view, it can be divided into two different parts. The first one is muscular endurance and the second strength endurance. Muscular endurance aims to develop the muscles aerobic-anaerobic energy production. The training resistance should be 0-30% of the maximal load. The recovery time is not complete meaning that it should be done as circuit training without giving the body much time to recover. This kind of training develops the strength and it is a very useful training method for adolescents because the loads are low and, therefore, do not place too much stress on the body. The second part is strength endurance and its aim is to develop the muscles anaerobic energy production and the muscles ability to get rid of lactic acid. The resistance should be 20-50% of the maximal load. Just like with muscular endurance exercises, the recovery time in strength endurance exercises should be incomplete and a circuit is a very effective way to train it. This develops strength efficiently in early adolescents, but it is at its most effective after puberty (Hakkarainen et. al. 2009, 204).

Speed strength can be described as a training method that aims to develop the nervous system's ability to activate muscle fibers as fast as possible (Mero et al. 2007, 258). The muscle fibers cross sectional surface area do not change. The resistance and weights should be light enough that the movement can be done fast, normally 0-50% of maximal load. The recovery in between sets should be complete. This training can be dangerous for adolescents and even adults, especially if the proper techniques are not used and if not done under supervision. When training for speed strength, maximal strength is also developed to some extent at the same time (Hakkarainen et. al. 2009, 204).

Table 2. Loads and repetitions for different strength training methods (Hakkarainen et. al. 2009, 204 simplified).

	Load	Repetitions (times)
Maximal Strength (nervous system)	80-100%	1-4
Maximal Strength (hypertrophy)	60-80%	5-15
Strength Endurance (muscular endurance)	0-30%	15
Strength Endurance (strength endurance)	20-50%	15-30
Speed Strength	0-50%	1-6

Maximal strength training should be carefully considered at the early part of adolescence. However, as the footballer matures and approaches the end of adolescence it is important to add maximal strength training exercises to the training program. Speed strength exercises should be included into training sessions for all adolescents keeping in mind that weights used should be low for the footballers in the early stages of adolescence. Finally, strength endurance is an important way to build some much required strength for all adolescents. Even at the early stages of adolescence, it is important to focus on strength endurance because having strong and healthy muscles can help prevent injuries that are common to adolescents (Hakkarainen et. al. 2009, 209).

Strength training is an aspect of football that should be focused on during the pre-season more than in the actual in-season. During the in-season there are a lot of games and strength training can easily take the sharpest edge out of an individual's performance because naturally, it causes some level of fatigue. This is why it is important to carefully plan the strength training sessions during the in-season so that they are not on days before matches. One or

even two strength training sessions in a week can be implemented and are even recommended because in football, there is very little that can be considered as being a strength enhancing activity (Ogolla, 2012).

#### 4.2.2 Strength Training in Kenya

Strength Training in Kenya can be more challenging than strength training in a developed country. Strength training is generally done in a weight room setting and that is where the real challenge arises because, according to Sholei, less than 1% of Kenya's football population has access to a weight room. This lack of facilities means that making an effective program for the general conditions in Kenya cannot focus around the weight room. All the exercises should be chosen so that they can be performed with very limited equipment (Sholei, 2011). This is challenging, however, it is not impossible because there are many effective ways for strength training with limited facilities.

In addition to the lack of facilities that make strength training challenging in Kenya, it is also the lack of proper knowledge from coaches that makes this aspect of physical fitness challenging. Many coaches lack the best knowledge on strength training especially when talking about sport specific strength training. As a result of this, the level of fitness for the players is rarely the same compared to their counterparts in the more developed countries (Kimanzi, 2012).

#### 4.3 Endurance

Having a good basic condition is central in all kinds of physical activities and sports. A good basic condition is the result of having good endurance and good muscle strength. Endurance is the body's ability to withstand fatigue, transport oxygen and use the oxygen in the muscles to produce the energy needed (Hakkarainen et. al. 2009, 285). The most important aspect when considering basic condition is endurance training. Endurance training can be described as exercises that involve the use of several large groups of muscles and, therefore, it is dependent upon the delivery of oxygen to the muscles by the cardiovascular system. In endurance training, the aim is to stimulate the body in one of the two ways. The first is by doing a certain exercise for a long period of time and the second is doing a certain exercise with a high load. When the stimulation happens in the form of a long lasting exercise, then the main emphasis is on the energy production. On the other hand, when the stimulation is desired by higher loading, then the emphasis is on developing the breathing mechanisms and



blood circulation and thus the maximal oxygen consumption is improved (Hakkarainen et al. 2009, 296).

There are four aspects that are generally considered when looking at endurance training and these four aspects are: basic conditioning, speed endurance, maximal endurance and pace endurance (Hakkarainen et al. 2009, 296). These can then be viewed as either continuous training or interval training methods. Continuous training – is running at a moderate intensity continuously, without rest periods (DiMaria, 2011). While Interval training is - higher intensity for shorter bouts separated by rest periods. Because of the constantly changing speed in football, the endurance training for footballers should include both continuous training and interval training (Waehner, 2011).

#### 4.3.1 The Basics for Endurance Training

Basic conditioning is an important part of all physical activities because without it, none of the other aspects can be trained effectively. It is the foundation for all other types of athletic training and that is why it is the most important part of endurance training for adolescents (Miettinen 1999, 207-208). The best method for developing basic condition is with low tempo and long lasting training. The main idea behind this is to improve the body's ability to use fats and also improve oxygen based energy production. For these goals to be reached, the training load must be low enough that the lactate levels in the blood do not raise too much above the resting blood lactate levels. This kind of training should feel light or moderately light and the individual should sweat a little but should also be able to talk comfortably during the training. At the beginning, the length of these exercises could be 20-30 minutes but as the condition improves they can be as long as 2-3 hours. However, the most important thing to keep in mind when talking about the basic conditioning is the load. Load can be simply described as the amount of work done in a given time (Hakkarainen et al. 2009, 296).

Speed endurance is similar in many ways to basic conditioning. The main difference being that the exercises are performed at a higher intensity and the energy produced by fats decreases. Speed endurance exercises should feel moderately heavy or heavy. Adolescents reach this loading level easily and, therefore, the load must be monitored very carefully. The best way to train for speed endurance is to do continuous training and interval type training. The exercises for speed endurance should be such that the training load fluctuates between aerobic and anaerobic levels. The continuous training exercises should last between 20-40

minutes and the interval training exercises should be between 5-20 minutes. In these exercises, the lactate levels should be clearly higher than during the rest (Mero et al. 2007, 338-339).

Maximal endurance training is important in sports where high levels of aerobic endurance are required. It is meant for improving the breathing and blood circulation related oxygen delivery capacity and the muscles' ability to use oxygen more effectively. Examples of exercises that greatly improve maximal endurance are running in a difficult environment, swimming and skiing. These exercises are generally done in different length interval training sessions. For the adolescents nearing adulthood, the exercises should last 3-10 minutes per set and in total the exercise should last 20-60 minutes (Mero et al. 2007, 340-341). For younger adolescents, the correct training intensity can be achieved by doing 3-5 minute sets. The normal rest time between the sets in interval training is 2-5 minutes and the sets are repeated 4-6 times depending on the fitness level of the individual and the training history. It is also beneficial to do some continuous exercises that last 15-30 minutes because that is an effective way to develop the body's ability to remove lactate and also build sheer grit. New studies have shown that perhaps the most effective way to train maximal endurance is to exercise at 90-95% of maximal heart rate that lasts 4-5 minutes. These intervals should be done 4-5 times with a 3 minute rest period in between. Thus, maximal endurance training aims to improve the body's ability to deliver oxygen to the muscles by improving the hearts beating ability which is a central factor when considering maximal oxygen consumption (Hakkarainen et al. 2009, 301-302).

Endurance training during adolescence is very important. When moving on to adulthood, the improvements in endurance training are not as effective anymore and especially in sports such as football where endurance is critical, the levels gained in childhood and adolescence are often critical. The aerobic qualities gained during childhood and adolescents can never be fully compensated by training during the adulthood (Hakkarainen et al. 2009, 307).

During the pre-season a lot of endurance training is required so that the players can be physically fit and ready to last the full 90 minutes. In the early part of the pre-season, continuous endurance training is good because the players are coming back from their off season and this is a good way to usher the players back into the training routines. Continuous endurance training is also good for recovery which is why, the day after a hard game, it is good to do some continuous endurance training. Interval training, on the other hand, is best at the later part of the pre-season when the players are already in good physical condition. During the

in-season, the amount of endurance training decreases automatically because, in the competitive games, players get the best possible endurance training. The off season and pre-season are the most important period to build and improve the endurance of all the players (Ogolla, 2012).

#### 4.3.2 Endurance Training in Kenya

Kenya is known to produce some of the best endurance athletes in the world. The high altitude combined with the long distances that children trek or run to school have over the decades resulted in Kenya producing some of the greatest long distance athletes that the world has ever known (Sholei, 2012). It is often generalized that all Kenyans must, therefore, have good endurance. This is, however, not true: because of urbanization most children do not need to travel long distances in search of education anymore (Ogolla, 2012).

Since a lot of money has been spent on athletics in Kenya over the years, Kenya has many professional athletic coaches. However, as mentioned earlier, football does not have a wealth of professional coaches working with adolescent footballers. Few coaches understand the different aspects of endurance training and as a result players are not as fit physically as they should be through proper training. If the coaches understand the different aspects of endurance training, it would be easy for them to implement these exercises in their practice sessions. Most of the endurance training for footballers is done by running. Fortunately, it is the one training method that does not require much equipment or any special facilities. Therefore, in this sense, endurance training in Kenya does not pose any specific challenges in the same way as strength training does. So long as the coach understands how to train for the different aspects, running exercises can be done almost anywhere (Sholei, 2011).

#### 4.4 Overview of Speed, Strength and Endurance

As a result of the information gathered during this research, it is concluded that speed, strength and endurance training can be effectively trained during the adolescent years. There are factors that have to be taken into consideration when working with adolescents because their bodies are developing at a rapid pace and that makes them more vulnerable to injuries. However, speed, strength and endurance training qualities can be safely and effectively improved during the adolescent years even in Kenya's harsh conditions.

#### 4.5 Skill

Being skillful is probably the most important aspect of being a great footballer. Without exceptional skills, a player can never be considered great, no matter how fast, strong or fit he may be. Skill is what leaves the fans in awe and what separates the great players from the good players. Skill is a talent or ability developed through training or experience. In football, everything from dribbling, passing, shooting, defending, heading and everything that has been learned is considered a skill (Ogolla, 2012).

Skill is a footballer's ability to choose and execute the right techniques at the right time, successfully, regularly and with minimum effort. A skill is something that must be acquired and, therefore, must be learned. During the learning process, there are many different things that happen within our bodies. They are based on neurology (nervous system), cognition (thought processes) as well as our feelings. Learning is a very complicated process and it can be extremely hard to understand. However, it is clear that, learning always happens as the result of practice (Hakkarainen et al. 2009, 237).

Skill is part of football that is absolutely necessary if a person wants to become a world class player. It is an aspect that should be worked on throughout the person's childhood as well as adolescence. By practicing certain skills, an individual learns to master those skills better and better. It is an aspect of football that cannot be neglected. If speed or strength have been overlooked in the early childhood and adolescence, it can still be possible to improve those qualities later on by training hard and in the correct way. However, skill is one aspect that cannot just be taught to a football player at a later stage in life. It must be developed continuously and the more skillful a player is the better chances he stands to become a world class player (Ogolla, 2012). The big difference between skill training in football and the other aspects of football such as speed, strength and endurance is that skill cannot be practiced too much whereas speed, strength and endurance training require adequate rest in between training sessions so that the body has time to recover. Coaches should make sure that they give players enough time to practice their individual skills because, it does not matter how great, strong or fast an individual is without adequate skill, these physical aspects are nothing (Kimanzi, 2012).

Skill is something that can be developed and learned at a very early age. It is said that young children learn the easiest. This seems to be true because most football stars share a similar

story of having started to play football at a very early age. Therefore, skill can be viewed as an aspect that every individual must work on by himself, it does not come automatically and it is very hard to teach certain skills (Ogolla 2012).

Skill is a quality that every footballer should work on during every part of the season. A few days break can result in the decreased sharpness of a certain skill (Kimanzi, 2012)). During the pre-season the main emphasis might be on endurance and strength training, but this does not mean that skill training should be overlooked. During the in-season skill training plays a bigger role because during this season, endurance and strength training should be at the required levels. The best players in the world spend several hours training by themselves at the training ground after everyone else has left because they want to hone their personal skills (Ogolla, 2012).

## 5 TESTING SPEED, STRENGTH AND ENDURANCE

Testing is an important part of developing physical qualities of all athletes (Keskinen, Häkkinen & Kallinen 2010, 12). Tests are carried out in order for the coach to see the fitness level of the individual players as well as the team as a whole. The tests should be planned so that they test for speed, strength and endurance because the coaches need this information in order to make the training program. Tests should not be viewed as a burden but rather as a chance for every individual to recognize his weaknesses and do something to improve them.

In the book by Keskinen et al., (2010, 14) which talks about fitness testing, it says that for any fitness test to be reliable, it must measure precisely the property that it has been made to measure. An example of this would be that if a coach plans to test the speed endurance of his players, then he must use a test that is meant for measuring speed endurance if that is what he wants to tests.

There are several factors that must be considered when planning a reliable test. First of all, the testing environment should always be the same or at least as similar as possible. For example, if a speed test is done at the beginning of the season at the beginning of a training session, then that same test should be done later on during the season, at the beginning of a training session and not at the end of a training session. The second thing is that the test must be conducted in a similar manner. This means that the timing devices used, the track or field used, and the distances covered should be the same for every time of testing and for every individual. The conducting of the test must be closely monitored and controlled. If there is no reliability in the tests, it is not worthy conducting them because the results will be faulty. A good test is one that is reliable and one that can be conducted in exactly the same manner over and over again (Keskinen et al. 2010, 14).

## 6 RESEARCH TASK

The purpose of this thesis was to produce an informative booklet for the FKF. The aim of it was to provide easily accessible information to the upcoming coaches in Kenya. It focuses on speed, strength and endurance training for adolescent footballers in Kenya. Specifically it provides information on how to safely and effectively train for the three qualities and also how to test them. From a student point of view the aim is to gain a deep understanding of speed, strength and endurance training for adolescent footballers.

The research tasks are:

- How could the coaching of adolescent footballers in Kenya be improved?
- How could speed, strength and endurance training be done effectively in Kenya?
- What kinds of exercises are best suited for the Kenyan environment?

## 7 PRODUCT DEVELOPMENT PROCESS

The purpose of this thesis was to produce an informative booklet for the FKF. The aim of it was to provide easily accessible information to the upcoming coaches in Kenya. It focuses on speed, strength and endurance training for adolescent footballers in Kenya. Specifically it provides information on how to safely and effectively train for the three qualities and also how to test them. From a student point of view the aim is to gain a deep understanding of speed, strength and endurance training for adolescent footballers.

### 7.1 The FKF as the Commissioner of the Thesis

The FKF is the body that is responsible for the running of football in Kenya. It is concerned with the development of adolescent footballers and it is constantly trying to improve the standards of football in the country. In order to improve football standards, the work must begin at the youth levels. In Kenya, there are very few professional coaches working with adolescent footballers and, as a result of this, an informative booklet was written that would help the coaches and provide some basic information for them. The FKF was interested in the idea because it realized that there is a lack of reliable and easily accessible information for youth coaches in Kenya. Therefore, through this thesis, the FKF will get a product which can help it develop the youth football program in the country and hopefully this will help raise the standards of football in Kenya.

The FKF will be responsible for all the expenses incurred in producing the booklet. The marketing will also be its responsibility because it is aware of the most effective ways to distribute the booklet. The copyright will be owned by me.

### 7.2 Product Development Process

This thesis is a theory based product development process and the final output of this work was an informative booklet. In the product development process, the final output must always be a concrete product. Important criteria when considering the product are its usability in the targeted group, the appropriateness of the content when considering the target group, the amount of information it provides and finally, it must be clear and easy to follow (Vilkkä & Airaksinen 2003, 51-53). The booklet that was produced would be used by the coaches in Kenya who work with adolescent footballers.



The first step in this product development process was to compile the necessary information regarding speed, strength and endurance. That information was collected from several different resources such as books, interviews and the internet. After collecting and critically examining the data from the different sources a theoretical background concerning speed, strength and endurance was written. After completing the theoretical background it was possible to start working on the product itself.

The first task concerning the product was to decide what the product would be. The two options were a dvd or a booklet. After taking into consideration the target group that this product was meant for, it was decided that a booklet would serve the target group the best because in Kenya many coaches do not have access to dvd players. The second task was to decide on the size and length of the booklet. The size that was eventually chosen was A5. The exact number of pages that the booklet would contain was not precisely known until all the information, pictures and sketches were inserted, however, according to initial plans it was to be between 35 and 40 pages.

After the size of the booklet and the estimated page numbers had been decided on, it was time to start compiling the booklet. A program called InDesign was used for compiling the booklet. First, the text was inserted and fitted accordingly on the different pages. Then the required photos were taken and inserted on the correct pages. Finally, the sketches required were drawn and inserted to their appropriate places in the booklet.

The final task concerning the booklet was to design the cover page and the back cover of the booklet and to decide what colors would be used. The front cover had to include the title of the work and the color scheme of black, red, green and white was introduced as it would be used in the entire booklet. The back cover contains the Kenyan flag. The different chapters were divided into different colors most notably so that green was used as the color in the speed chapter, black was used as the color in the strength chapter and finally red was the color used in the endurance chapter. These three colors are the dominant colors in the Kenyan flag and this was the reason why they were chosen as the colors for the booklet. Having the different chapters in the different colors was also designed to make it easier for the reader to distinguish between the different topics covered in the booklet.

### 7.3 The Thesis Process

Talks on writing the thesis and how big a process it could be started during my first year of studies. From the beginning, I knew that I wanted to do my thesis on a topic that would benefit Kenyan football in some way. Finland is officially my home country but at the same time I have always considered Kenya my home because it is where I was born and this was a reason for my desire to focus my thesis on a topic that would be relevant to Kenya. In January 2012, I seriously started to think about a topic for my thesis after I had had a very interesting interview with the FKF's vice Chairman Sammy Sholei. During the interview, I realized that Kenya had a problem in the youth coaching sector and that easily accessible information was not available for the coaches. At the end of that interview, I asked if the FKF would be willing to be the commissioner for this thesis and that was how the process began.

The first task was to decide on the scope of this thesis. I wanted to talk about all the important aspects of coaching adolescent footballers but I realized that it could not be possible because it was too broad a topic. After reading widely about coaching youth footballers and considering the conditions in Kenya, I decided to narrow down the topic and focused on speed, strength and endurance training. I chose these three aspects because they are overlooked in the training of youth footballers in Kenya. I also wanted to briefly include skill because it is arguably the most important quality in football.

After several months of research and conducting a few interviews, I compiled the first draft of the booklet in May 2012. Since the booklet was meant for coaches of adolescent footballers in Kenya, I wanted to make sure that the booklet was clear, easy to follow and one that anyone without any coaching experience could use. I accomplished this by using simple terminologies and many photos and sketches. As the saying goes, "one picture can tell more than a thousand words." I made sure that the booklet was divided into "speed," "strength" and "endurance." These sections will make it possible for readers to read only the section that they are interested in without having to read through the entire booklet to find the information that they desire.

Since my practical training in Kenya was done between April, 2012 and July, 2012, some feedback was gathered regarding the booklet from the local coaches as well as from the contact person at the FKF, Sammy Sholei. With the feedback that was received, several adjustments were made that greatly improved the quality of the product. The main areas that were

revised were: clarity of terminologies, some photos and the language. English is an official language in Kenya; however, many of the locals prefer to use Kiswahili. At this point, it was necessary to start thinking about the possibility of eventually translating the work into Kiswahili. But because of time constraint, the process of finalizing the booklet in English began.

## 8 DISCUSSIONS

In this final chapter, the ethicality and reliability of this thesis are discussed. The product of this entire work is also evaluated. Finally, this thesis will discuss how this process of writing the thesis has advanced my professional development.

### 8.1 Ethicality and Reliability

When doing any kind of research work, it is important to uphold high ethical values. During the process of writing this thesis, some key guidelines on research ethics have been followed. Honesty, objectivity, integrity, carefulness, openness and respect are all factors that have been considered in this research.

Data, results, methods and procedures have been presented honestly. That means, research results are not to be fabricated, falsified nor should the data be misinterpreted intentionally. Researchers have to be honest in all forms of scientific communications. One way of honesty is to give credit to someone when using ones work and avoiding plagiarism (Hirsjärvi, Remes & Sajavaara 2004, 25). Objectivity is another important factor that has been considered when doing this research and it means avoiding bias in data analysis and data interpretation throughout the entire research project. Avoiding bias is challenging when an author has a strong opinion about a certain topic and this is the reason why it is important for researchers to keep these points in mind throughout the entire process (Resnik, 2012).

Integrity in research means keeping promises and agreements. Whether working with other researchers or research partners, integrity is an important part of a research project. Carefulness is also something that has been considered and that means avoiding careless errors by carefully and critically examining the work that has been done. Openness which is sharing data and being open to criticism and new ideas is also an important aspect of research work. In particular, being open to criticism and new ideas is important because authors are sometimes blind to their own work and, as a result, they are unable to take constructive criticisms. Finally, respect in research means to honor copyrights and other intellectual property (Resnik, 2012).

As well as being ethical in research, it is also important to consider the reliability of the work. Results are considered reliable when several different tests on a particular topic or idea produce the same answers. However, in the case of this thesis, reliability has been viewed

differently because this is not a qualitative nor a quantitative research but rather a product development process. One way to consider the reliability of this work is to look at how well it can be implemented elsewhere. For example, the booklet could be tested in Tanzania or Uganda, which are two countries that are similar to Kenya. If the product proves helpful in these countries, then that would add reliability to the product.

Another factor that adds reliability to this thesis is my own background in the field of sports and my experiences with football in Kenya. Having lived in Kenya for nearly 20 years of my life, I have a wide understanding of the country and more specifically of the football situation in Kenya. Having previously worked as a conditioning coach with Gor Mahia FC which is a team playing in the First Division in Kenya, I witnessed the lack of facilities and professional coaches at all levels of football. This previous experience has greatly aided me during this thesis process and it has enabled me to critically look at the environment into which this booklet will be applied. With that experience and knowledge that I have gained during my work and time spent living in Kenya and the skills I have acquired during my studies at Kajaani University of Applied Sciences, I hope that I have succeeded in making a reliable and a functional product.

## 8.2 The Product Evaluation

It has been very clear in my mind from the beginning what I wanted the product to be. I was very eager to work on the product itself even before I wrote the theoretical background of this thesis. Soon I realized that I needed to complete the theoretical background before compiling the booklet itself. It was after that when I knew what I needed to include in the contents of the booklet.

After the arduous and time consuming task of writing the theoretical background, I began the process of compiling the booklet. This part of the thesis is the one that I enjoyed the most. In a way, the work is very practical because I have come up with exercises and drills that are possible to use in the Kenyan environment. Since my practical training took place in Kenya, I have tried out the different drills to make sure that they are applicable. I also discussed the different drills and exercises with the coaches in Kenya and received their feedback before I finalized the drills and exercises. Therefore, I have made sure that the exercises and drills that I have used in this booklet are the most relevant.

I am very pleased with the final outlook of the booklet. The colors of the Kenyan flag have been used as the theme throughout the booklet. Therefore, the green, the red and the black colors have been used as well as white. There are photos, sketches and diagrams to help clarify the different exercises and drills in the text. Initially, everything was intended to be in black and white but later it was discovered that the cost of paper quality determined the color of the booklet. As a result, the colors mentioned above have been used because they will make the booklet more appealing.

Finally, the commissioner of this work, the FKF, is pleased with the final product. That is most important because the product is for its consumption. The FKF is happy that the drills and exercises can be performed with limited facilities, a factor that is crucial in the Kenyan environment.

### 8.3 Professional Development

Writing a thesis is a long and challenging process. Finding a topic that is genuinely interesting is critical because getting motivation to do the work required can be challenging if the topic is not of great interest. I was very fortunate because I was able to write the thesis on a topic I am most interested in. I have always wanted to work with adolescent footballers. In future, I hope to work with adolescent footballers and I believe that this thesis process is going to be a great foundation for that dream. I have gained much knowledge on speed, strength and endurance training for adolescent footballers and I now understand the importance of training each quality.

During this thesis writing process, I have had a chance to advance my skills in the field of coaching because that is what my studies focused on at Kajaani University of Applied Sciences. With the skills that I have acquired from Kajaani University of Applied Sciences, I have put them into practice while working with adolescent footballers in Kenya. This has been important because it has been motivating to see how the skills learned at school works in real situations.

Time management and following schedules have been other factors that have guided me during this process. Because I have written this thesis myself, I have decided the pace at which the work has been done. I have also made sure that the deadlines the school had set for me have been met. Working alone requires a lot of self-discipline and a lot of self-

motivation but at the end of it all, I am glad that I have written the thesis myself because the gains would have been limited had I worked with a partner.

Finally, I have come to understand what writing a thesis is towards the end of this process. If I had understood the process this well beforehand, the topic would most likely have been slightly different. I am glad that this topic was chosen because it has the potential to help coaches working with adolescents in Kenya. The world changes constantly and it is very likely that in ten years' time, Kenya will have more professional coaches and better facilities. Until then, it is my hope that this thesis will make an enormous difference.

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