

**INSTRUCTIONAL RESOURCES AND STRATEGIES ON PARTICIPATION IN
ADAPTED AQUATICS FOR LEARNERS WITH PHYSICAL IMPAIRMENTS
IN JOY-TOWN SPECIAL PRIMARY SCHOOL IN KIAMBU COUNTY, KENYA**

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UNIVERSITY**

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DECLARATION

I confirm that this thesis is my original work and has not been presented in any other university/institution for certification. The thesis has been complemented by referenced works duly acknowledged. Where text, data, graphics, pictures or tables have been borrowed from other works- including the internet, the sources are specifically accredited through referencing in accordance with anti-plagiarism regulations.

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DEDICATION

I dedicate this thesis to my family and to all learners with Physical Impairments.

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I wish to acknowledge my supervising lecturers Dr. Nelly Otube and Dr. Jane Mwangi for their endless commitment in providing me guidance and support throughout the research period. Special thanks to all individuals and firms that helped me in the production of this educational write up.

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ABBREVIATIONS

AAHPERD	:	American Association of Health, Physical Education, Recreation and Dance
ABA	:	Architectural Barrier Association
APE	:	Adapted Physical Education
IDEA	:	Individuals with Disability Education Act
IEP	:	Individualized Education Plan
KU	:	Kenyatta University
MoE	:	Ministry of Education
MoEST	:	Ministry of Education Science and Technology
PD	:	Physically Disabled
PE	:	Physical Education
SNE	:	Special Needs Education.

ABSTRACT

The study sought to analyze the instructional needs and resources for Adapted Aquatic activities for learners with Physical Disability at Joy-Town Special Primary School Kiambu County Kenya. Children ought to get 60 minutes or more physical activity every day, including children with physical disabilities as it is an excellent way of improving motor fitness, physical fitness, social skills and self-confidence of learners with disabilities. However, most PE teachers are not conversant with Adapted Aquatics since it is not included in the curriculum offered in diploma and certificate Teacher Training Colleges. Moreover, there is very little literature on participation in adapted aquatics in Kenya with respect to instructional resources. The study was guided by Ernest Kiphard motor adaptation theory (1983) which emphasizes the interactions between the teacher, learner and the environment. The study took the form of a case study which involved the selection of 62 learners from classes 5, 6 and 7, 3 administrators namely the head-teacher, deputy head-teacher and the senior-teacher, 3 Physical Education teachers and the swimming instructor were targeted yielding a total of 69 respondents. Using stratified random sampling based on gender, 35 learners were selected. 3 administrators namely the head-teacher, deputy head-teacher and the senior teacher, 3 Physical Education teachers and the swimming instructor were purposively selected for the study making a total of 42 respondents (60.87%) of the target population. Questionnaires, interview guide and an observation checklist were used to collect the data. The data collected was coded and analyzed using descriptive statistics such as frequency distribution tables and measures of central tendency. It was then presented in form of tables, graphs and pie-charts. The study found out that the strategies used in teaching adapted aquatic lessons included use of IEP, preparation of remedial aquatic lessons and use of aquatic games after class work where learners practiced the learnt skills. Instructional materials for adapted aquatic activities were found to be insufficient. Some learners never participated in swimming lessons due to medical conditions while others had a negative attitude toward the sport. There were numerous challenges faced when teaching adapted aquatics activities. The challenges included inadequate facilities, lack of sufficient swimming equipment, lack of funds to organize swimming gala and lack of collaboration of the multidisciplinary teams in the swimming. The researcher recommends that to cater for the individual needs for learners with physical disabilities, the swimming pool and other facilities should be adapted and modified.

CHAPTER ONE

INTRODUCTION AND BACKGROUND OF THE STUDY

1.1 Introduction

This chapter presents the background to the study, statement of the problem, purpose of the study, objectives of the study, research questions, significance of the study, limitation and delimitation of the study, assumption of the study, theoretical framework and conceptual framework and operational definition of key terms.

1.2 Background to the Study

Adapted Aquatics include swimming and other water safety instructions for children with disabilities is an individualized swimming and water activity program meant for education and leisure purposes. Adapted Aquatics involves modifying the aquatic teaching environment, skills, facilities, equipment and instructional strategies for learners with disabilities (Sherrill, 2012). Children ought to get 60 minutes or more physical activity every day, including children with physical disabilities (Physical Activity for Everyone, 2010). It is an excellent way of improving motor fitness, physical fitness, social skills and self-confidence of learners with disabilities (Lepore, Gayle, & Stevens, 2007). Daily, physical activity is an essential part of staying healthy. Exercise can improve mood, mental health, bone and muscle strength, and help with weight control. Being physically active can also decrease the risk for certain diseases, such as cardiovascular disease, diabetes, and cancer. The general belief is that aerobic exercise promotes a healthier longer life. Swimming is a popular form of aerobic exercise that

appeals to all ages, provides cardiovascular benefits while working the entire body, yet creates less joint stress than other forms of exercise (Abu, 2012).

The term disability describes impairment in a person's ability to function. The disability can be physical, mental or sensory. Physical disability refers to a condition that incapacitates the skeletal, muscular and neurological system of the body to some degree. Many individuals with physical disabilities have no concurrent mental disability (Ann & Turnbull, 2007).

In Netherlands, approximately 130,000 children (4%) between the ages of 6 and 19 years had a physical disability (Netherlands Institute for Social Research, 2012). These children often participate less in sports than children without physical disabilities (Maher, Williams, Olds & Lane, 2007). The benefits of sports have been documented frequently and generally include an increase in health and physical fitness and a decrease in secondary conditions, such as type 2 diabetes and obesity. These benefits are also very much applicable to children with physical disabilities (Majnemer, Shevell, Law, Birnbaum, Chillgaryan, Rosenbaum & Poulin, 2008).

The Individuals with Disability Act (IDEA), identifies students who experience physical disabilities as "Orthopedically impaired" which refers to a severe impairment that adversely affects a child's educational performance. The term includes impairments caused by congenital anomaly, by diseases like poliomyelitis as well as bone tuberculosis, and impairments from other causes like cerebral palsy, amputation, and fractures or burns that cause contractures. Although IDEA uses the term orthopedic

impairments, children with physical disability may have neurological conditions or musculoskeletal conditions. A neurological condition affects the nervous system: the brain, nerves and spinal cord. The muscles and bones are healthy but the neurological messages sent to them are faulty or interrupted. Three of the neurological conditions are cerebral palsy, spina bifida, and seizure disorders (Fraser, Heinsinger, & Phelps, 2013). Musculoskeletal conditions affect the muscles, bones, or joints to such degree that they cause limitations in their functional use. Spinabifida, muscular dystrophy, congenital malformation are some of the musculoskeletal conditions. Although neurological and musculoskeletal conditions are two distinct and separate conditions, they may cause similar limitations in movement. Findings from several studies indicate that Adapted Aquatics are vital for people with Physical Disability.

The United States congress passed the Architectural Barrier Act (ABA) of 1968 which required buildings to be accessible by all. The Rehabilitation Act of 1973 mandated that all programs and facilities receiving federal support must be accessible to individuals with disabilities specific to aquatics; all federal funded pools were made accessible by such means as hydraulic lifts or sloped entries. Today, adapted aquatics philosophy has been expanded to include boating, infant and preschool swimming and scuba diving.

Egypt was among the ancient cultures that linked the aquatic environment and water to medical treatment and rehabilitation of individuals with disabilities (Lepore, Gayle, & Stevens, 2007). According to Ballard, Caldwell, Dunn and Hardinson (2005) the school physical education programme offers the best opportunity to provide physical activity to all children, including those with PDs and to teach them the skills and knowledge needed

to establish and sustain an active life style. Physical education facilities and equipment are therefore of great significance to educational experiences in physical education. One of the goals of physical education is the total development of the participant's physical, mental, social and emotional well-being.

Swimming is among the sports that were introduced in the sports syllabus in 1935. It has always been referred to as a sport for the 'elite' since very few schools can afford the facility (Gatwe, 2007). Many teachers are not conversant with swimming since it is never taught in any certificate or diploma teacher training college. Only those teachers who have graduated from some University having taken PE as subject of study have the relevant training. However, most schools for learners with physical disability do not offer it as a PE subject (Gatwe, 2007). Additionally, most students in special schools with PD cannot engage in it unless they are well trained and the necessary resources and equipment availed.

Moreover, very little is documented about Adapted Aquatics although Kenyatta University offers Adapted Physical Education as a unit in the sports department. Joy-Town Special Primary School for learners with physical disability has an aquatic facility. However little is recorded on any competitive aquatic activity. The main aim of the study therefore is to analyze instructional needs and resources for Adapted Aquatic activities at Joy- town primary school for physically disabled in Thika Municipality in Kiambu County, Kenya.

1.3 Statement of the Problem

The overall aim of Physical Education is to enable learners acquire skills which lead to the development of physical, mental, emotional, health and social aspects of the learner. Although PE is a mandatory teaching subject in the Kenyan primary school curriculum, the instructional strategies must be adapted to accommodate learners with physical disability. Research shows that learners with Physical disability do not receive equal opportunities in Physical Education as other children (Gathua, 1990). Lack of equal opportunity in physical education among learners with physical disability negatively affects their development in physical, health, socialization and self-esteem aspects (Johnson, 2009).

Swimming is one of the components of PE; however it is only available to schools that have access to a swimming pool (Gatwe, 2007). Adapted Aquatics are important to learners with physical disability as they improve their physical fitness, social skills and create a competitive spirit in them. It is evident that children with physical disabilities are among the least physically fit populations in the world (Healthy People, 2010). Despite the significance of swimming to learners with physical disability, most PE teachers are not conversant with Adapted Aquatics since it is not included in the curriculum offered in diploma and certificate Teacher Training Colleges. Moreover, there is very little literature on participation in adapted aquatics in Kenya with respect to instructional resources. Most of the previous studies have mainly focused on Adapted Physical Education and swimming in regular schools. The current study focused on instructional resources and strategies on participation in adapted aquatics for physically impaired learners in joy-town special primary school in Kiambu County, Kenya

1.4 Purpose of the Study

The purpose of the study therefore was to establish the influence of instructional resources on participation in Adapted Aquatic activities for learners with physical disability at Joy-Town Special School in Kiambu County.

1.5 Objectives of the Study

The study research objectives sought to:

- i) Investigate the strategies used in teaching Adapted Aquatics.
- ii) Find out the availability and adequacy of instructional resources used when teaching Adapted Aquatics.
- iii) Explore the professional training level of teachers of Adapted Aquatics in the school.
- iv) Explore the opinions of students towards active participation in Adapted Aquatics.
- v) Find out challenges facing the instruction of Adapted Aquatics

1.6 Research Questions

- i) What instructional strategies do teachers use in teaching Adapted Aquatics?
- ii) What is the state of the instructional resources needed to teach Adapted Aquatics in Joy-Town Special Primary School?
- iii) What is the professional training level of teachers involved in Adapted Aquatics in Joy-Town Special Primary School?
- iv) What are opinions of learners have towards active participation in Adapted Aquatics?
- v) What are the challenges experienced by teachers teaching Adapted Aquatics.

1.7 Significance of the Study

Adapted Aquatics are important to learners with physical disability. The findings of the study may bring awareness to schools handling learners with physical disability of the importance of an aquatic facility within the institution. The teachers will learn the instructional methods in teaching Adapted Aquatics. Curriculum developers and education planners may learn its important role for both therapeutic and educational purposes. Out of this the education planners will be in a position to manipulate variables that need to be addressed for optimal development and well-being of learners with physical disability.

1.8 Limitations of the Study

There was also scarcity of related literature on Adapted Aquatics in Kenya hence; the researcher relied mostly on foreign literature. Though the opinions of parents and community would have been very useful in this study, it was not possible to cover them because tracing them required considerable amount of time, resources and other logistics. However the researcher gathered enough views regarding this category from the other respondents who closely work and interacts' with the learners.

1.9 Delimitation of the Study

The study was confined to Joy-Town Special School as it was the only school for learners with PH which had an aquatic facility. The study was also confined to classes 5-7 as swimming lessons in the school were mostly introduced in class five. Additionally, class 8 learners were exempted from the study as they were an examination class and had also participated in the pilot study.

1.10 Assumption of the Study

- i) The respondents would provide genuine responses regarding the state of facilities and other resources.
- ii) The teachers who teach aquatics in the school have relevant professional training.

1.11 Theoretical Framework and Conceptual Framework

1.11.1 Theoretical Framework

The study was guided by Ernest Kiphard motor adaptation theory (1983). The theory states that the individual and environment interact as means of maintaining homeostasis. Persons not only adapt to the environment but they alter and change the environment each time they respond. Adaptation is the process by which individuals and the environment reciprocally change one another. The process is continuous, dynamic and bidirectional. The purpose of education is to change the behaviors of learners but the teaching-learning process changes both the teacher and the learners.

Effective learning is largely dependent upon an understanding of human variables and change process. The term variable refers to anything that can be changed. In adapted aquatics for learners with physical disability, many variables are operative. The variables interact in the teaching-learning process and they can be altered to promote success. The variables includes; facilities and equipment, opinions and beliefs of the learners and the significant others as well as instructional strategies.

Equipment and facilities should be adapted appropriately. The swimming pool and the changing rooms should be adapted physically to enhance success of each individual

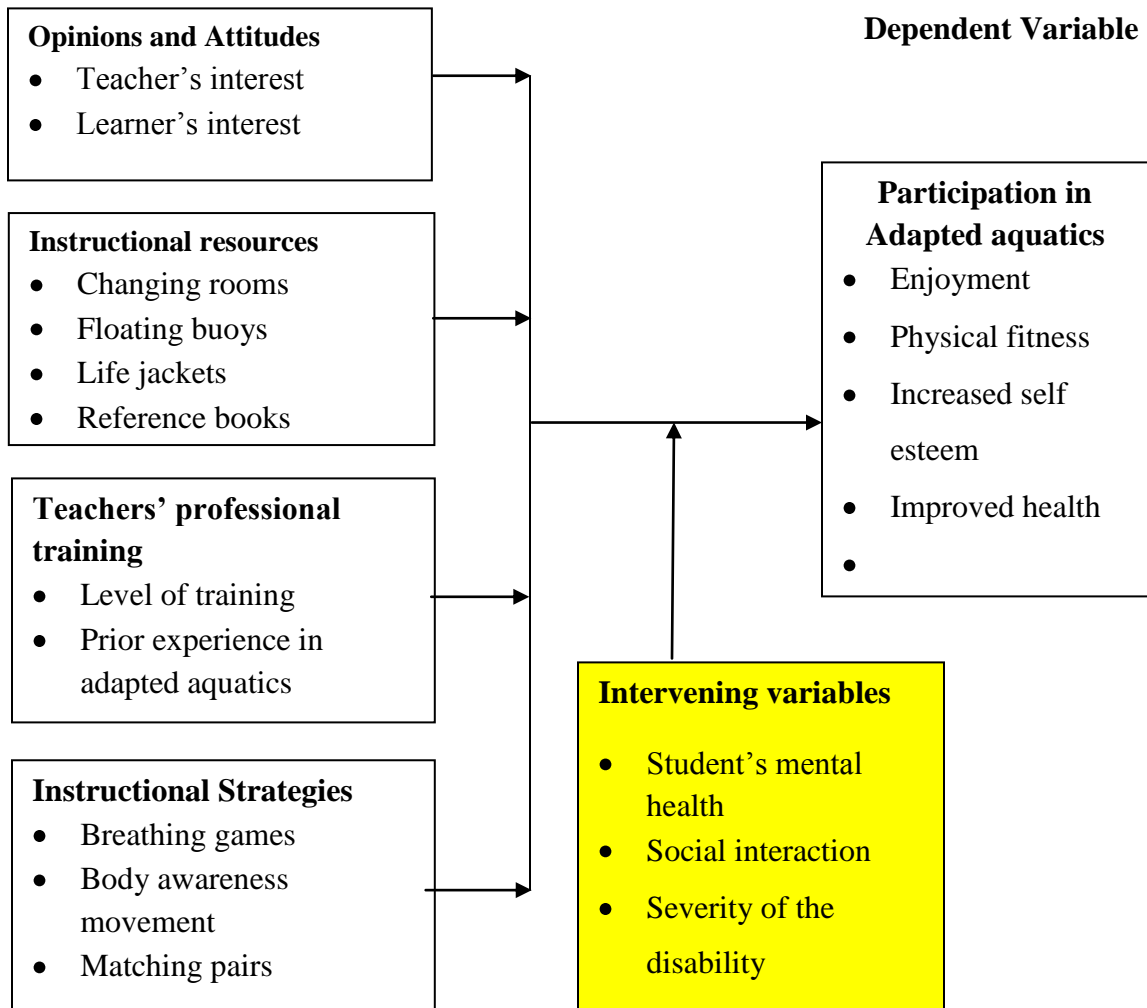
learner. Various specifications should be put in place when coming up with a swimming pool for people with physical disabilities. They may include the movable ramps, pool lifts, non-skid floors and deck, several ways to turn water on and off among others. Provision of flotation devices is vital especially to those with dwarfism and spinabifida. Opinion and beliefs refers to feelings about self and others. How the teachers, parents and significant others view learners with physical disabilities. This affects their self-perception skills. Teachers and caregivers should be supportive.

The instructional variables include the syllabus, teaching methods and structure of time. Adapted Aquatics aims at modifying any existing swim stroke, game or activity to meet the needs of individuals with disabilities. Teachers should adapt the curriculum so that the learners with disabilities experience minimal failures. This would enhance preservation of ego strength and confidence when they experience success (Sherrill, 2012).

The success of Adapted Aquatics depends on the availability, adequacy, suitability of equipment and facilities (Arnheim, Auxter, & Crowe, 2017). It also depends on adapting the curriculum and teaching methods to individual needs, so as to minimize failure and preserve ego strength. Sherrill (2012) argues that professionals should be knowledgeable about variables and be able to match abilities with content and teaching style to create optimal learning opportunities.

1.11.2 Conceptual Framework

Independent Variable



KEY

 Study Variables

 Non-study variables

Figure 1.1 Determinants of Effective Adapted Aquatics (Sherrill, 2012)

The conceptual frame stipulates the active participation in adapted aquatics which is the dependent variable, depends on the adaptation of various variables. Adaptation is the transformation of goal oriented human, environment and physical activities variables, so as to promote desired outcomes. The independent which include opinion and attitudes of learners, equipment and facilities available, the personnel and instructional strategies influence participation of learners with physical disability in adapted aquatics. The intervening variables explain the link in between the dependent variables and independent variables. When successful interaction of the variables occurs, the participation of learners with physical disability is increased. This leads to better social interactions, enjoyment, physical fitness, increased self -esteem and improved health among learners with physical disability.

1.12 Operational Definition of Key Terms

Adapted Aquatics : An individualized swimming and water activity program for learners with physical disability

Adapted Physical Education: Modification of physical activities and environment to enable learners with special needs participate actively.

Aquatics : Water activities that include swimming, boating, diving.

Disability : The loss or reduction of functional ability.

Equipment : Movable apparatus in Adapted Aquatics like the floaters and pool-buoys.

Facilities : Indoor and outdoor teaching areas for Adapted Aquatics like the swimming pools and changing rooms.

Handicap : A condition produced by societal and environmental barriers.

Impairment : Any disturbance or interference with the normal structure and function of the body.

Instructional needs : Curriculum requirements and activities in Adapted Aquatics.

Instructional resources : Teaching materials used by teachers in Adapted Aquatics like the syllabus.

Teaching strategies : Methods used when teaching Adapted Aquatics

CHAPTER TWO

RELATED LITERATURE REVIEW

2.1 Introduction

The existing relevant literature was reviewed under the following themes; benefits of adapted aquatic participation, measuring effective aquatic program, instructional strategies, facilities and equipment, personnel, attitudes and opinions of teachers and learners and overall challenges facing adapted aquatics.

2.2 Concept of Adapted Aquatics and Benefits

The evolution of cultural interest in aquatic environment dates back to ancient Chinese, Greek, and Egyptian cultures, which used water for soothing and healing purposes (De Vierville, 2004). Later, in Europe during middle ages, large pools and spas were built. In the early 20th century before World War 1 Charles Lowman, known as the father of water exercises for therapeutic purposes, began his work in California with patients with cerebral palsy, paralysis and infectious diseases (Lepore, Gayle, & Stevens, 2007). He systemized it hydrotherapy which he defined as treatment of diseases, disabilities and ill-health using water as a therapeutic medium. Rehabilitation of soldiers and civilians who were wounded during World War 11 increased awareness of and demand for all types of therapy, creating greater need for a therapeutic aquatic activities. Several years later, during the post-World War 11, physicians realized the benefits of water exercises for people with polio. This increased the number of clientele using water exercises for rehabilitation. Participation in water rehabilitation as it grew; researchers carefully studied several programs and concluded that water exercises had many benefits for overall rehabilitation (Lepore, Gayle, & Stevens, 2007). The early efforts of using water

for therapy that were made by medical personnel led to many efforts towards meeting the needs of individuals with disabilities including instructional, recreational and competitive programs. By 1960's, the separation between using water as therapy and using it for people with disabilities in instructional and recreational setting begun. Adapted Aquatics therefore evolved as awareness increased that all persons should have opportunities to learn basic swimming skills (Sherrill, 2012).

The Individuals with Disability Education Act (IDEA) began as the Education for all Handicapped Children Act in 1975. It mandated free and appropriate public education, including special education in the least restrictive environment. It defines special education as instruction that is specifically designed to meet the unique needs of children with disabilities. This includes Physical Education. Physical Education is defined as development of: physical and motor fitness fundamental motor skills and patterns, instruction in aquatics, dance, individual and group games and sports, (Federal register, 1977).

Persons not only adapt to the environment but change it each time they respond. In Adapted Aquatics for the physically handicap many variables interact in the teaching-learning process. They can be altered to promote success. The variables includes physical environment that is facilities and equipment. Facilities include the swimming pool, shower rooms, cabinets, and decks among others. Equipment includes kickboards, pool buoys, life-jackets, pool toys among others (Sherrill, 2012). The ability to move easily in water fosters a level of independence and control that some people with physical disability cannot achieve on land. Enjoyment of swimming is a social asset that can carry

over to other areas of life (Champion, 2012). A person with physical disability, who sees himself as more independent mover in water can improve his self-image. The aquatic environment helps establish early patterns of movement for people with physical disability. Land based programs may sometimes be effective but can also pose safety risks for children with physical disability. Therefore, alternative low-impact exercise programs are recommended (Fragala-Pinkham & Harley, 2008).

Research done by Getz, Hutzler and Vermeer (2015) on effects of aquatic intervention on perceived physical competencies and social acceptance in children with cerebral palsy; comparing the effects of aquatic intervention with those of land based intervention and social function found that aquatic interventions appeared to have a positive effect on social acceptance and social functions as reported by the care givers. Aquatic environment, specifically buoyancy, enabled children to be more active and to initiate multiple social interactions with their instructors and other children. These opportunities are limited on land because of gravitational constraints; Thelmas (2014) suggested that movement had a positive impact on motivation, specifically because of interactions affecting the environment.

One of the major motivational factors in initiating and maintaining participation is perceived competencies (Thelmas, 2014). Competent motor behavior can have a positive influence on the development and behavioral aspects, while in turn can affect overall development (Vargas, 2015). A student with physical disability who experience independence in water can improve body image. The freedom of movement made possible by water not only boosts morale but also gives individuals with disability the

incentive to maximize their potentials in other aspects of rehabilitation (Skinner & Thompson, 2016).

Although Adapted Aquatic does not focus on the therapeutic water exercises, warm water itself facilitates therapeutic goals and is useful for healing some diseases and ailments. The application of water through immersion is called medical hydrology (Becker, 2011). Biological effects of immersion in water 92-96 degrees Fahrenheit or 34-36 degrees Celsius includes the effective transfer of heat to the body, which in essence relieves pain and promotes relaxation due to thermal energy transfer. The weightlessness effects produced by the interaction between buoyancy, hydrostatic pressure, and the viscosity and cohesion properties of water supports the body and at the same time provide resistance (Vargas, 2015). Other therapeutic benefits of immersing the body up to the chest or higher include lymphatic compression, venous compression, increased central blood volume, increased cardiac volume, increased arterial pressure, increased stroke volume, increased cardiac output, increased work of breathing, increased oxygen delivery, improved dependent oedema, increased muscle blood flow, off-loading of body weight, decreased joint compression with movement, increased blood flow to the kidneys, higher pain threshold, suppression of sympathetic nervous system activity and promotion of excretion of metabolic waste (Becker, 2011).

Adapted Aquatics activities can help improve breath control and cardio-respiratory fitness. Blowing of bubbles, holding the breath, and breathing out through the mouth and nose all improve respiratory function as well as oral motor control which can aid speech and decrease drooling and feeding problems (Martin, 2009). In addition, water immersion

exerts pressure on the respiratory system and increases breathing work by approximately 60% which in combination with rhythmic breathing activities strengthens respiratory muscles and enhance respiration (Champion, 2012). Findings from several studies indicate that Adapted Aquatics are vital for people with physical disability.. For instance (Kelly & Darrah, 2005) on the effects of a 10 weeks aquatic program, on gross motor function, range of motion and spasticity for children with cerebral palsy found out that swimming strengthens muscles that enhance the postural stability necessary for loco motor and object control skills. The case study targeted 29 children with cerebral palsy. The researcher concluded that aquatic activities have the following effects on children with cerebral palsy: Decreasing muscle tone, increasing motor function, increasing walking efficiency and functional abilities as well as increasing quality of life and socialization (Lepore, Gayle, & Stevens, 2007).

Movement in water through Adapted Aquatic activities also yields the following therapeutic benefits: relaxation, relief of pain and muscle spasms, maintained or increased range of motion in joints, re-education of paralyzed muscles and improved muscle strength and endurance (Skinner & Thompson, 2016). Specifically swimming strengthens muscles that enhance posture, thereby helping to develop the stability needed to learn new skills in locomotion and object control (Karthryn, Rachel, & Tamara 2014).

For students with physical disability, regular physical activity is encouraged in order to prevent diseases and promote their physical well-being (Fragala-Pinkham & Harley, 2008). There are three primary components of physical fitness: cardiovascular endurance, muscle strength and endurance, flexibility (Rimmer, Riley, & Wang, 2009). Students

with physical disability experience reduced strength, poor flexibility, weak endurance, and depression (Johnson, 2009). In addition they are at risk of developing cardiovascular diseases, type11 diabetes, high blood pressure, obesity and osteoporosis due to sedentary lifestyle (Finch, Owen, & Prince, 2014).

Adapted Aquatics have immense contribution to motor skills and physical fitness development for children with physical disability. Kelly and Darrah (2005) reviewed literature on aquatic exercises as a modality for children with cerebral palsy. Through their review they found several studies to indicate that aquatic exercise programs improved muscle strength, cardio-respiratory function, and gross motor skills for children with cerebral palsy. Fragala-Pinkham, O'Neil, and Harley (2010) Massachusetts General Hospital Institute of Health Professions also evaluated the effectiveness of aquatic exercise program on fitness and swimming skills in children with physical disability. Using an A-B design, sixteen children age between 6 to 11 years with disabilities participated in a program lasting 14 weeks. The children had cerebral palsy, and autism spectrum disorder and spina bifida. Of the 16 children who had participated they found out that the majority improved their swimming skills and physical activity levels. The majority showed improvement in endurance, strength, confidence and self-esteem.

Similarly a study was carried out in University of Rhode Island on the effectiveness of a surfing intervention on children with disabilities (Courtney, 2013). The results indicated that surfing program improved several areas of physical fitness. There was significant improvement in the participant's upper body, core and cardio-respiratory endurance.

Several additional physical benefits of movement through water includes relaxation, relief of pain and muscle spasms, maintained or increase range of motion in joints and re-education of paralyzed muscles (Courtney, 2013). The motivational and therapeutic properties of water provide a stimulating learning environment even for individuals with severe disabilities (Becker, 2011). A person with physical disability can use the aquatic fitness gained in class to participate in enriching and competitive aquatic activities such as competitive swimming, boating, scuba diving, skiing among others (Lepore, Gayle, & Stevens, 2007). The current study therefore sought to establish the influence of instructional resources on participation in adapted aquatics activities for learners with physical disability in order to achieve the benefits stated above.

The Kenya Constitution (2010) states that children with disabilities have a right to access educational institutions and facilities that is compatible with their interests. The constitution emphasizes the important role of special education as facilitating persons with special needs access learning and bring them to function as productively and independently as possible in their communities.

PE was made compulsory in all schools following a Presidential Decree of 1980. Therefore it is an integral part of education and cannot be overlooked. Adapted Aquatics are a component of APE in the Kenyan school curriculum. Adapted Aquatic program comprises of fun-filled activities known to have physical social emotional, cognitive and recreational benefits, that can be carried over to other functional and life-long skills. Although water activities do not magically solve life's problems, there are recreational

benefits that children with physical disability experience. Warm water has a sedative effect and produces physical and mental relaxation (Sherrill 2012).

In the current study, psychosocial variable has been referred to as attitude and feelings about self and others. It also considers the number of persons sharing the space. How the learners with physical disability are perceived by teachers, other learners and parents. Instructional variables include the syllabus, teaching style, level of assistance during practice and structured use of time. The variables are interrelated and geared towards effective performance of Adapted Aquatics. Provision of relevant facilities and equipment, appropriate adaptations and appropriate Adapted Physical Education syllabus can enhance success in learners with physical disability. The current study therefore sought to establish the adequacy and availability of instructional resources for adapted aquatics for learners with physical disability at Joy-town Special School, Kiambu County.

2.3 Instructional Strategies used in Teaching Aquatics

Adapted swimming program modifies swim strokes for individuals who do not have the strength, flexibility, or endurance to perform the standard version (Lepore, Gayle, & Stevens, 2007). This activity requires the Halliwick method of water orientation. The method uses a one to one teaching ratio until swimmer gains confidence for small group instructions. A teacher in the water encourages and supports the learner, learning through play and games. It also emphasizes on body awareness movement, exploration and breathing games (Champion, 2012). Researchers have shown improvements in all aquatic capabilities in individuals with disabilities when they have been exposed to Halliwick

method of aquatic instructions. It has also been reported that the Halliwick method of aquatic instruction is safe for people of all ages and with any type of disability (Sherrill, 2012).

The use of therapeutic aquatic exercise has also been explored based on its benefits. Therapeutic aquatic exercise is simply defined as the use of aquatic exercises designed to aid in the rehabilitation of various disabilities and conditions (Bates & Hanson, 1996). The use of swimming and exercise activities in the water have benefits that are well documented in the literature (Broach & Datillo, 1996). The ultimate goal of therapeutic aquatic exercise is to prevent dysfunction and aid in the development, improvement, restoration, or maintenance of normal function including muscular strength and endurance, flexibility and mobility, relaxation, coordination, and at the appropriate time, cardiovascular endurance (Bates & Hanson, 1996).

An important example of cooperation in inclusive settings, through a dynamic systems perspective, is the “peer tutor” strategy (matching pairs, with and without disabilities, in order to achieve successful learning by all) (Mauerberg-deCastro et al., 2013). Peer tutoring is an appropriate strategy for situations in which no specialized services are available, in classes with a large number of students or with a lack of equipment, and where students with disabilities need special attention. However, perhaps the most important justifications were revealed by research on the effects of the peer tutor model: increased speed of learning, motor development gains, improved social acceptance and superior sense of identity, among others (Peters, 2009).

Studies show that having contact with students with disabilities in school alone does not ensure changes in the teachers' attitudes (Monteiro & Manzini, 2008; Wong, 2008). On the other hand, children who have contact with peers with disabilities during school show greater tolerance and a greater moral obligation toward inclusion than do those without contact (Gasser, Malti, & Buholzer, 2013). However, if such contact is not supervised throughout school routines, exclusion and harassment (which tend to increase in frequency with students' age) usually affect the educational activities, and prove to be especially damaging to students with disabilities (Michailakis & Reich, 2009).

MacDonald and Block (2005) advised that students with a disability can gain the skills to be successful with not only including themselves in PE, but also within other extracurricular sport and active recreation activities and community programs. They suggested a number of strategies that may assist students with a disability to be their own advocate in PE: educate students about their disability, if necessary by developing a rapport with the students so that they feel comfortable expressing their needs and wants; provide examples like articles, books, movies, or personal knowledge of individuals with similar disabilities who have experienced success in physical education, physical activity and sport depending on comfort level, have the students educate peers about their disability ; have a weekly or once-per-cycle meeting with the students to discuss modifications and address questions or concerns they may have; be a good listener by listening to suggestions, ideas and modifications given by the students; provide feedback by letting the students know that they are doing a great job of assisting you with their

physical education program; and be prepared to assist students in modifying activities and sports in which they are less familiar.

A policy framework for special needs education (2009) in Kenya on issues and constraints in curriculum stated that the curriculum for learners with special needs is always delayed in publishing and this makes the students lag behind in syllabus coverage. It further states that the curriculum is rigid and uses rigid methods of evaluation. Study done on ‘constraints facing the Teaching of Adapted Physical Education in Joy Town Secondary School for the Physically Handicapped in Thika Municipality’ by Gichia (2009) concurred with the above facts. In his study he stated that the syllabus was not appropriate in meeting unique needs of learners with physical disability. He indicated that the objectives were stated vaguely and activities were unsuitable for learners with physical disability (Gichia, 2009).

Time allocated per lesson for Adapted Physical Education (35minutes) was inadequate because half of the time was used in preparation before and after the lesson. In Adapted Aquatics ample time is needed, time for undressing, showering and dressing. Students with severe disabilities should be assisted in dressing procedures and applying moisturizing cream or oil to dry skin immediately after swimming (Sherrill C. , 2012).

2.4 Instructional Resources used in Adapted Aquatics

The availability of adequate facilities, equipment and supplies as well as their utilization are important ingredients in any physical education and sports programme. The level of success of most physical education and sports programmes is greatly dependent on the

degree of availability, adequacy and utilization of up-to-date facilities, equipment and supplies. This is because they form the hub around which such programmes revolve (Mgbor, 2005; Mgbor and Anyanjan, 2005).

Longman (2000) explained adequacy as a situation in which there is enough resources for a particular purpose. Mapaderum (2002) opined that adequacy is a satisfactory condition of resources in an organization. He added that adequacy of facilities, equipment and supplies in schools promote effective teaching and learning activities in the school while their inadequacy affects the academic performance negatively. Hornby (2006) asserts that adequacy is a condition in which something is enough or good enough in quantity for a particular purpose or need. Adequate availability of equipment and facilities and their proper utilization have been positively correlated to good performance in examinations while poor performance has been blamed on inadequacies, (Maduewesi, 2010). Adding that where equipment and facilities are lacking, teaching may be poorly executed.

Adequacy as will be used in this study therefore means satisfactory or acceptable quantity of resources as required for success in teaching of physical education in primary schools. Different policy making bodies in secondary school education in Nigeria recommend adequate physical education, Sports, and recreational facilities and equipment as one prerequisite for establishment and operation of a secondary school in the country. According to Tsiga, (2005) schools shall provide adequate physical education, sports and games facilities, and equipment as well as other recreation facilities as one of needed condition for operation.

According to Offorma (2002) teaching is usually facilitated and is more effective through the active participation of the learners and utilization of appropriate resources. Active participation of the learner in physical education is facilitated by the availability and effective utilization of adequate instructional resources personnel, facilities, equipment and supplies. Akande (2005) noted that teaching and learning are better and easier done through one's interaction with one's environment. Environment here refers to facilities and equipment utilized in teaching physical education. Similarly, Egwu (2005) noted that it is obvious that teacher competency and available instructional facilities and equipment in a school determine the coverage of syllabus and curriculum of any subject including physical education.

According to Ikioya (2008) the schools Physical Education programme require the availability and adequacy of facilities, equipment and supplies for the attainment of set goals. School resources have been observed as a potent factor to quantitative and qualitative education (Owoeye 2011). This is especially important in Physical Education because of the activity oriented nature of physical education. Aboyomi (2008) noted that availability of adequate facilities and equipment is of vital importance in physical education. The author added that funding or financing is equally an important factor affecting the implementation of the school physical education programme.

Standard facilities and equipment are essential prerequisites to good and impressive performance. Lack of adequate and standard facilities and equipment hampers physical education programme in many ways. Adedeji (2000) pointed out that there must be sufficient motivation in the form of attractiveness of facilities, supplies and equipment to

captivate athlete's interest to participate in sports or games. He further stated that the facilities and equipment in secondary schools in this country are simply not good enough and are hindrance to physical education and sports development in the schools. Commenting on the state of facilities, equipment and supplies in secondary schools in Nigeria, Orunaboka and Nwachukwu (2012) noted that in Nigeria today it is well understood that the major cog in secondary schools success in physical education are sub-standard facilities and lack of sophisticated equipment. They added that Nigerians also lack maintenance culture. Effective physical education in schools requires organizational and administrative variables such as personnel, facilities, equipment, supplies and finance.

The National Special Needs Education Policy Framework (NSNEPF, 2009) in Kenya aims at ensuring that learners with special needs fully participate and are treated equally in learning activities at all levels. However it agrees that there are several challenges relating to access and equity in provision of education and training for learners with special needs and disabilities. Inappropriate infrastructure, inadequate facilities and lack of equipment for learners with special needs and disabilities is a major challenge. Learners with special needs require more materials and resources for their education than their non-handicapped peers (MOEST, 2003). A study done by Gathua (1990) on instructional problems constraining teachers of PE in special primary schools for physically handicapped noted that the facilities and equipment were grossly inadequate in the schools. Similarly Gichia (2009) agreed with Gathua that facilities and equipment were the major problems facing APE. He noted that some facilities were lacking and the available ones were not adequate hence led to non-participation in APE activities by

some students. He also stated that most of the facilities and equipment were not adapted to meet the unique needs of learners with physical disability.

Learners with physical disability require recreational, sports and therapeutic facilities. For effective aquatics, various modification and accommodation needs to be availed. The swimming pool should have easy accessibility. Ramps, pool stairs, pool lift capable of being operated on by a person with disability for safe entry and exit should be installed (Sherrill, 2012). Warm water of 92-96 degrees Fahrenheit or 35.5- 36.5 degrees Celsius is recommended (Becker, 2011). Provision of flotation devices for students who cannot stand at the bottom of the pool like those with dwarfism is vital. A deck for crutches, wheelchairs and mobility equipment, hand bars and rails, non-skid surfaces for floors and deck (Sherrill, 2012). Large storage cabinets, wide doors into the locker room to allow wheelchairs, kick-boards, pool buoys among other equipment. The spirit of Adapted Aquatics program suggest that teachers need to do what they can possible to allow people with disabilities to participate as much as possible in a given program, while ensuring the safety of all participants and maintaining the intent of the program. This study sought to establish the adequacy and availability of equipment and facility for learners with physical disability at Joy-town Special School, Kiambu County.

2.5 Professional Training of Teachers of Adapted Aquatics

In his study in Nigeria on the Status of P.E. Instructional programme in Secondary Schools in Nsukka Education zone, Alor (2006) stressed that besides having sound instructional programme on ground, the number and qualification of the teacher is yet another important factor to be considered in teaching of physical education in secondary

schools. According to the author, equally important apart from availability of adequate facilities and equipment is the teacher's experience on the job. Adapted Aquatic instructors or teachers should have extensive training in adapted physical activity and Adapted Aquatic programming since such teachers were more likely to uphold positive attitude when teaching participants with severe disability (Conaster, Block, & Lepore, 2000).

The Kenya Policy Framework for Special Needs Education (2009) on capacity building and human resource development revealed that there is insufficient number of trained teachers in SNE thus having an effect on teacher learner ratio in learning institutions in Kenya. It further states that while some special institutions are lacking teachers, sometimes special needs trained teachers are posted to schools where their services are not required or are not posted at all.

The Education Act Kenya (1980) stipulated that an approved curriculum should be taught by trained teachers. The presidential working party on education and manpower training for the next decade and beyond (Kamunge, 1988) upheld the same views. However, lack of trained teachers in special needs education is a critical issue affecting provision of special needs education programs. Gathua (1990) findings stated that 81% of the teachers in special schools were not trained in Adapted Physical Education. The trained teachers lacked confidence they felt they were not adequately prepared to teach Adapted Physical Education. The teachers sympathized with students and this led to instructional problems. All schools lacked teacher aids and spotters. In Adapted Aquatics trained teachers must have studied aquatics in their program of study. Swimming which is one of the aquatic

activities is only taught in Kenyatta University as a unit in PE. The study sought to establish if the teachers of adapted aquatics at Joy town Special School had adequate training.

2.6 Attitudes and Opinions of Learners and Teachers towards Adapted Aquatics

Crawford and Godbey (2010) conceptualized three major factors influencing any sport and leisure activity. The first revolves around facilities, equipment, time money and information. The second factor revolves around interactions or relationships between individuals and having a partner to participate with them. The third factor revolves around psychological states such as depression, anxiety and beliefs. These factors are crucial to effective learning but conversely, their non-availability can pose a constraint (Crawford & Godbey, 2010).

In Nigeria, Ugwu (2002) regretted the attitude of some school heads that show great apathy to Physical activities and sports. Ugwu (2002) further added that such situations found in schools are not healthy development since many sports stars could be left behind. National Teacher Institute (2002) outlined the following as the major factors affecting the availability of Physical Education facilities, equipment and supplies in schools: careless planning of programme by the games teacher or games master; employment of unqualified teachers to handle Physical Education; lack of funds, and poor maintenance of existing facilities and equipment.

Literature shows that, in most countries, as supported by campaigns by the UN Convention on the Rights of the Child in 1989, and the U.N. Convention on the Rights of

Persons with Disabilities (2006), teachers tend to show favorable attitudes toward the inclusion paradigm, as long it is accompanied by resources and incentives for teacher training (Gerghut, 2010, Peterson, 2006; Monteiro & Manzini, 2008). In fact, regardless of teachers' training experiences, students with disabilities at various stages of severity, who are included in regular schools, show better scores on academic tests and can more adaptively solve challenges presented by the community (Jordan, Schwartz, & McGhie-Richmond, 2009).

Njororai (1990) Physical Education and sport for all in Kenya (proceedings of the 1st African regional conference on Physical Education, recreation and dance) stated that PE is still considered to be either “jumping in the field” or allowing students to carry on their own studies. Gathua (1990) noted that there is negative attitude by administrators towards Physical Education. Some schools prohibited practical PE lessons. The administrators opted for therapy instead of PE. Sherrill (1998) stated that teachers display negative attitude towards APE for the physically handicapped due to fear of legal liability. However, Adapted Aquatics are low-impact activities hence no fear of injury (Martin, 2009).

A study done by Gatwe (2007) on Psycho-social factors affecting participation in swimming in Nairobi secondary schools indicated that the level of interest was found to be the most significant variable influencing participation in swimming. Students did not have much interest. This was attributed to the fact that many students were introduced to swimming in high school for the first time hence preferred other sports they were familiar with. Gatwe further described swimming as a sport for the “elite” in the society. Students

from high cost schools and major provincial schools showed much interest in swimming. Other factors affecting participation for the physically handicapped are self-discrimination, stereotyping, esteem and self-fulfilling prophecy (Frank, 2012). Wuest & Bucher (2015) argued that discrimination results from myths, super-stations and sport control. The imposed myth is that persons with disabilities are inferior and different from the so called “normal” athlete. Research indicates that integration does not promote positive attitude unless specific interactions experiences are planned and the environment is carefully structured. Favorable conditions like social interactions, cooperative rather than competitive or individual activities, contacts are rewarding and pleasant, modeling positive attitudes by teachers and significant others is important (Sherrill C. , 2012). The current study aimed at finding out the opinions of learners and teachers towards adapted aquatic activities for learners with physical disability at Joy-town Special Primary School, Kiambu County.

2.7 Challenges Facing Instruction Adapted Aquatics

Most research on sports participation of children with physical disabilities tends to focus either on children, their parents or health professionals working with children with physical disabilities or a combination of two of these groups. Barriers to sports participation mentioned by parents of children with physical disabilities were the physical, social and cognitive demands of sports, transport, lack of information or lack of equipment, lack of time, and costs (Kars, Hofman, Geertzen, Pepping & Dekker, 2009). Health professionals mentioned the need for adaptive equipment, sufficient information on how to use equipment and instruction on how to successfully conduct sports classes, as requirements for sports participation (Jaarsma, Dijkstra, Geerzen & Dekker, 2014)..

Facilitators mentioned by parents were fun, social contacts and transport. A recent qualitative study on children with cerebral palsy showed that children participated in sports because they enjoyed it, felt capable or could do the activity with someone else (Shihui, Jin, Mei & Lau, 2007). However, all these studies only focused on describing sports participation from only one perspective, which does not allow distinguishing differences in perspectives on sports participation of children with other physical disabilities.

To our knowledge, no study has combined the experiences of children, their parents and health professionals on the barriers and facilitators of sports in the same study. By combining perspectives from children, their parents and their health professionals into one study (i.e. triangulation), a more comprehensive insight into the complex phenomenon of sports participation can be provided than only one perspective could do (Martin, 2006). This study therefore aimed to provide comprehensive information about the barriers and facilitators of sports participation of children with physical disabilities by triangulating data from children, their parents and their health professionals.

According to Ojoade (2011) inadequacy of fund to the schools as provided by the government is the main problem of secondary schools in Nigeria. Correspondingly, this situation affects the extent of availability of resources for the Physical Education programme in the schools. Similarly Okwor (2003) blames the failure of Curriculum Reforms in Nigeria (CRN) on the inability of the initiators of the programme to mobilize adequate resources (human, material and financial) to prosecute it and transform the plan into reality.

Standard facilities and equipment are essential prerequisites to good and impressive performance. Lack of adequate and standard facilities and equipment hampers physical education programme in many ways. According to Awosika (2009), it might be impossible to achieve satisfactory results from athletes whose training facilities and equipment are inadequate or of sub-standard. The scarcity of physical education facilities, supplies and equipment could therefore constitute a big cog in the successful teaching of physical education in schools. Availability as will be used in this study therefore means human and materials resources ready for use in teaching physical education in the schools.

A lot of development and expansion has been taking place in every sphere of education in Kenya. The policy framework for special needs education (2009) on capacity building and human resource development revealed that provision of special needs education is still limited. The policy stated that the cost of providing educational services to learners with special needs is relatively high and constitutes the single most limiting factor to increased enrollment, retention and transition of such learners within the educational programs. Learners with physical disabilities should receive an appropriate Adapted Aquatics program. Appropriate means a program designed to meet individuals' needs (Siedentop, 2009). Frank (2012) noted that an appropriate APE program require resources. These resources include teaching personnel, facilities and equipment.

Gathua (1990) findings of the study indicated that the major instructional constraints confronting PE teachers of learners with physical disabilities included the following; wide range of age, abilities and disabilities. Lack of facilities like gymnasium, the use of

un-adapted equipment and facilities, inadequate time allocation causes discomfort for teachers and a feeling of unpreparedness to teach PE to learners with physical disability resulting from lack of relevant training. The current study sought to find out challenges facing the instruction of Adapted Aquatics at Joy-town Special School, Kiambu County.

2.8 Summary of the Literature Review

Adapted Aquatics which includes swimming and water safety instructions for educational and leisure purposes for people with disabilities has always been an excellent way to improve motor fitness, physical fitness, social skills and confidence for people with physical disability (Lepore, Gayle, & Stevens, 2007). Being a low-impact exercise program, Adapted Aquatics poses no danger or physical injury to learners with physical disability (Fragala-Pinkham & Harley, 2008). Adapted Aquatics are a component of Adapted Physical Education. They involve modifying aquatic teaching environment, skills, equipment, and instructional strategies for learners with physical disability (AAHPERD, 1996). Aquatic exercise programs provide a dynamic environment that is safe, practical and beneficial for children with physical disability. Several studies done on Adapted Aquatics indicate its benefits. University of Rhode Island carried out a study on the effectiveness of a surfing intervention on children with disabilities (Courtney, 2013). The results indicated that surfing program improved several areas of physical fitness. However studies done on APE by other researchers like Gathua (1990) Kenyatta University on Instructional constraints facing teaching of APE for the physically handicap noted that facilities and equipment for APE were inadequate.

Gichia (2009) study on Constraints facing teaching of APE in Joy-Town Secondary School stated that the facilities and equipment were not only inadequate but not adapted. He further cited lack of teachers and a rigid curriculum as major constraint. Former studies however focused on the overall APE. Gathua (1990) focused on overall APE in primary schools for the physically handicap, while Gichia (2009) focused on APE in Joy-Town Secondary School for the physically handicap. The reviewed studies did not focus on Adapted Aquatics and the facilities, equipment, instructional strategies and psychosocial variables that need to be manipulated. The current study sought to specifically analyze the extent to which instructional resources influence participation in Adapted Aquatic activities in Joy-Town Special Primary School for the physically handicap.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

Addressed in this chapter is, research design, variables, location of the study, target population, sampling techniques, sample size, research instruments, piloting, determination of reliability and validity, data collection techniques, data analysis and logistical and ethical considerations.

3.2 Research Design

The study used case study design. The case- study seeks to describe a unit in detail, in context and holistically. It is a way of organizing educational data and looking at the object to be studied as a whole (Orodho, Nzabwirwa, Odundo, Waweru, & Ndayambaje, 2016). This allowed the researcher to gather information on the influence of instructional resources on participation in Adapted Aquatic activities at Joy-Town Special School Kiambu County. The study applied mixed approach. Mixed method approaches are procedures for collecting, analyzing and mixing both qualitative and quantitative data in a single study (Creswel, 2012).

Qualitative research is primarily used to gain an understanding of underlying reasons, opinions and motivations (Orodho, Khatele, & Mugiraneza, Concise Statistics: An illustrative approach to problem solving, 2016). Quantitative research on the other hand is used to quantify the problem by way of generating numeric data or data that can be transformed into usable statistics (Orodho, Nzabwirwa, Odundo, Waweru, & Ndayambaje, 2016). In this study quantitative data was used to describe quantifiable

influence of instructional resources on participation in adapted aquatics while qualitative data was used to describe those that could not be quantifiable and describing views and feelings of the respondents.

3.2.1 Study Variables

Independent Variable

The independent variables are those attributes that brings about variations. They are: instructional personnel, instructional strategies, facilities and equipment, opinion and attitudes of learners and teachers towards Adapted Aquatics.

Dependent variables

The dependent variable is the measure of an aspect of the participants that depends on the manipulation of the independent variables. In this study, the dependent variable is participation in Adapted Aquatics, the outcomes and the effects.

3.3 Location of the Study

The study was carried out in in Joy-Town Special Primary School for the physically handicapped. The school is situated in Thika Municipality Kiambu County Kenya. Thika is an industrial town situated about 45km to the North East of Nairobi the capital city of Kenya. It covers an area of about 220 square kilometers. The school is one of the oldest schools for the physically handicapped in Kenya. It has learners with the three major categories of physical disability namely neurological, musculoskeletal and other health impairments. Being a government boarding school, the teachers, rehabilitation professionals and a nurse are employed by the government. It is currently accommodating 278 students from ages 6 -20 years. It was established in 1961 by

missionaries affiliated to the Salvation Army. The area was selected because no similar study, to the best knowledge of the researcher, had been conducted in the area of study.

3.4 Target Population

Target population refers to all the subjects liable to participate in a study.

Table 3.1: Target Population

Administrators	No.	APE Teachers	Swimming Instructors	Target Population of Learners Class	Total	
Head Teacher	1	3	1	5	20	25
Deputy H/T	1			6	21	22
Senior Teacher	1			7	21	22
Total	3	3	1	62	69	

The study targeted a total of 62 learners from classes 5-7. Classes 5, 6 and 7 are targeted due to the fact that most of the learners in these classes are involved in competitive sports. They are more experienced than the younger ones and have a better sense of the environment. Class 8 was left out because it was an examination class. The three administrators involved in the study were the head-teacher, deputy head-teacher, and the senior teacher. The three teachers handling Adapted Physical Education were involved. In addition, the swimming instructor was also involved making a population of 69 respondents.

3.5 Sampling Technique and Sample Size

3.5.1 Sampling Techniques

The researcher used both purposive and simple random sampling to obtain the study sample. The researcher purposively sampled the school, the administrators, teachers and the swimming instructor since they had the information required for the study, therefore reliable for the study (Mugenda & Mugenda, 2003). Joy-Town Special School was purposively selected among other schools for the physically handicapped. Learners were selected using simple random sampling technique since they were the primary focus of the study. The use of simple random sampling technique was useful because it gave the respondents an equal opportunity to participate in the study.

3.5.2 Sample Size

A sample size of 42 participants comprised of 35 learners, the head-teacher, deputy head-teacher, senior teacher, 3 APE teachers and the swimming instructor.

Table 3.2 Distribution of the respondents in Joy Town Special School

Administrators	No.	APE Teachers	Swimming Instructors	Sample of Learners Class	Total	
Head Teacher	1	3	1	5	11	16
Deputy H/T	1			6	12	13
Senior Teacher	1			7	12	13
Total	3	3	1	35	42	

3.6 Research Instruments

The data was collected using observation checklist, questionnaires and interview guide.

Interview guide

Interview guide is a set of questions that an interviewer asks when interviewing a respondent. It makes it possible to obtain data required to meet the specific objectives of the study (Creswel, 2012). In the study, the administrators were interviewed due to their busy schedule. An interview can produce in-depth data not possible with questionnaires (Cohen, Mannion, & Morrison, 2011). The interview guide had open ended questions focusing on availability and maintenance of the equipment and facilities for Adapted Aquatics.

Questionnaires

Two sets of questionnaires were used. The first set solicited information from students on attitudes towards active participation in Adapted Aquatics. The second questionnaire targeted the Adapted Aquatic teachers and the swimming instructor. This helped gather information on availability, adequacy, adaptation of the aquatic facilities and equipment.

It also solicited information on knowledge, experience, and appropriateness of the Adapted Physical Education syllabus for the physically handicapped.

Observation checklist

Observation checklist solicited information on available equipment and facilities. The researcher observed an aquatic class in session to determine how teachers carry out their lessons. She also observed the learners behavior during an aquatic lesson.

3.7 Piloting

Before the actual study the instruments were piloted in Joy-Town Special School as it was the only school for learners with physical disabilities that had an aquatic facility.

Piloting was useful in determining the validity and reliability of the instrument and the time taken to administering the questionnaires; this was necessary for making corrections and revisions of the instrument before the actual study. Five class 8 learners, APE teacher handling class 8 and the games teacher participated in the pilot study. The respondents used in the pilot study were not used in the main study. Relevant modifications including editing ambiguous items, removing irrelevant items and adding more valuable items relating to research questions were done before administering the instrument to the study sample. The modifications included correcting ambiguous question items and irrelevant questions. The data collected was analyzed using descriptive statistics.

3.7.1 Validity

This is the accuracy and meaningfulness of the inferences which will be based on the research results (Mugenda & Mugenda, 2003). Content validity was established through critique from the supervisor and other lecturers and modifications made. It was done during the construction of the questionnaires.

3.7.2 Reliability

Reliability was ensured through a split half method where the instruments were administered to the respondents then the items were divided into two halves using odd and even numbers. The results from the two halves were correlated using spearman-brown and the results used to estimate reliability of the questionnaires. A correlation of about 0.80 established that the questionnaires were reliable.

3.8 Data Collection Techniques

The administration of research data collection instruments was done by the researcher both at the pilot and the main study. The researcher used self-administered questionnaires where the respondents filled in by themselves. An introductory letter was sought from the Department of Educational Administration and Planning, University of Nairobi, to help obtain a research permit from the National Commission for Science, Technology and Innovation (NACOSTI). A copy of the permit and an introductory letter was presented to the County Commissioner and the County Director of Education, Kiambu County. The researcher then visited the school, book appointments and made a good rapport. Consent letters were then administered to the respondents in order to allow only those who were willing to take part in the study to do so. The researcher then administered the questionnaires to the three categories of respondents; swimming instructors, teachers and learners. The respondents were expected to tick the response that best represent their opinion and write down some comments on the same. The swimming instructors and the teachers were given five days to respond to the questions. However, the students answered the questions within a period of one hour and questionnaires were collected. The researcher also observed lessons scheduled to solicit information on appropriateness of the instructional strategies and resources; if adaptations and modifications were effective and the level of participations by learners with physical disability in adapted aquatics. Information gathered from the observation was recorded in the observation schedule and in the field note book.

3.9 Data Analysis

The researcher used both quantitative and qualitative data analysis techniques for this study because both approaches complement each other. Quantitative data were coded, assigned labels to variables' categories and fed into the computer. The data were then analysed descriptively with the aid of Statistical Packages for Social Sciences (SPSS). Frequency tables, bar-graphs and pie charts were used to present the information. Inferential statistics such as mean and standard deviation were utilized to summarize the relationship between independent and dependent variables. Qualitative data were organized into themes and discussed based on research objectives. Inferences were made from each theme and conclusions were drawn and recommendations made from the findings.

3.10 Logistical and Ethical Consideration

Logistics in research involves all the activities and actions that the researcher must undertake to ensure successful completion of the study. Before the researcher embarked on the study, an introduction letter to carry out research was sought from the Dean, School of Graduate Studies, Kenyatta University. This letter facilitated the acquisition of research permit from the Ministry of Education through National Council of Science and Technology. Before any data could be gathered, the participants were made aware that their responses were confidential and that the information was purely for academic purpose. In the analysis and dissemination of the results, names of schools and the names of the participants were not used to ensure anonymity of participants.

CHAPTER FOUR

PRESENTATION OF FINDINGS, INTERPRETATION AND DISCUSSION

4.1 Introduction

This chapter presents data analysis and discussion. The analysis is related to the research objectives and research questions stated in chapter one of this study. The findings have been presented in figures and tables. Discussions on the findings have also been provided to interpret the meaning of the findings. The purpose of the study was to establish the influence of instructional resources on participation in adapted aquatic activities among learners with physical disabilities. The study objectives sought to:

- i) Investigate the strategies used in teaching Adapted Aquatics.
- ii) Find out the availability and adequacy of facilities and equipment used when teaching Adapted Aquatics.
- iii) Explore whether the teachers of Adapted Aquatics in the school have the relevant professional training.
- iv) Explore the opinions of students towards active participation in Adapted Aquatics.
- v) Find out challenges facing the instruction of Adapted Aquatics

4.2 General and Demographic Information

In this study, a sample size of 42 participants who included 35 learners with physical disabilities, 3 PE teachers, 3 administrators and 1 swimming instructor. All the 39 questionnaires were filled and returned hence yielding a return rate of 100%. The interview guides from the 3 administrators and one observation schedule were analyzed.

4.2.1 Gender of the Teachers

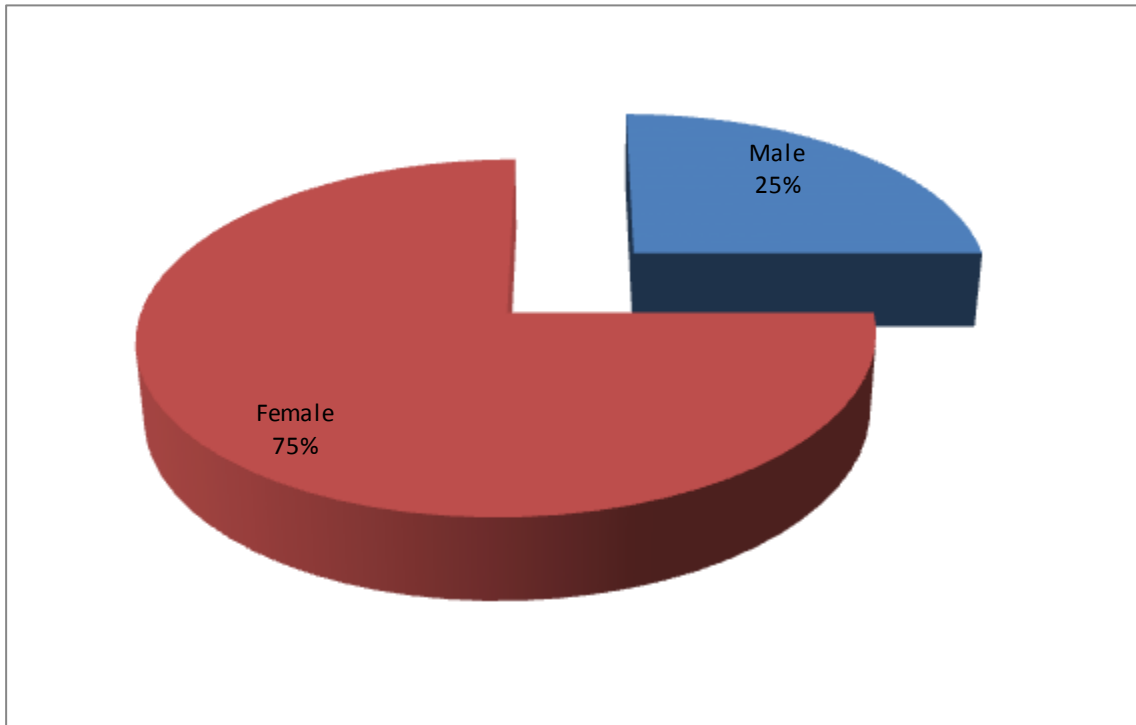


Figure 4.1 Gender of the Teachers

Figure 4.1 shows the gender of the teachers who participated in the study. Majority (75%) of the teachers were female while minority (25%) of the teachers was male. This could be attributed to the fact that teaching children with physical impairments was seen as a feminine career which entails motherly care. This concurs with Kinyua (2014) who found out that most teachers of learners with special educational needs were female due to the job description which involved care and training in daily living skills. It however contradicts Marilyn (2014) who found out that there was gender parity among special education teachers due government policy on empowering women and gender equality. It however contradicts Marilyn (2014) who found out that there was gender parity among special education teachers due to government policy on empowering women and gender equality.

4.2.2 Distribution of Learners with Physical Disability by Gender

It was important to establish the gender difference among learners with physical disability. The results were presented in Figure 4.2.

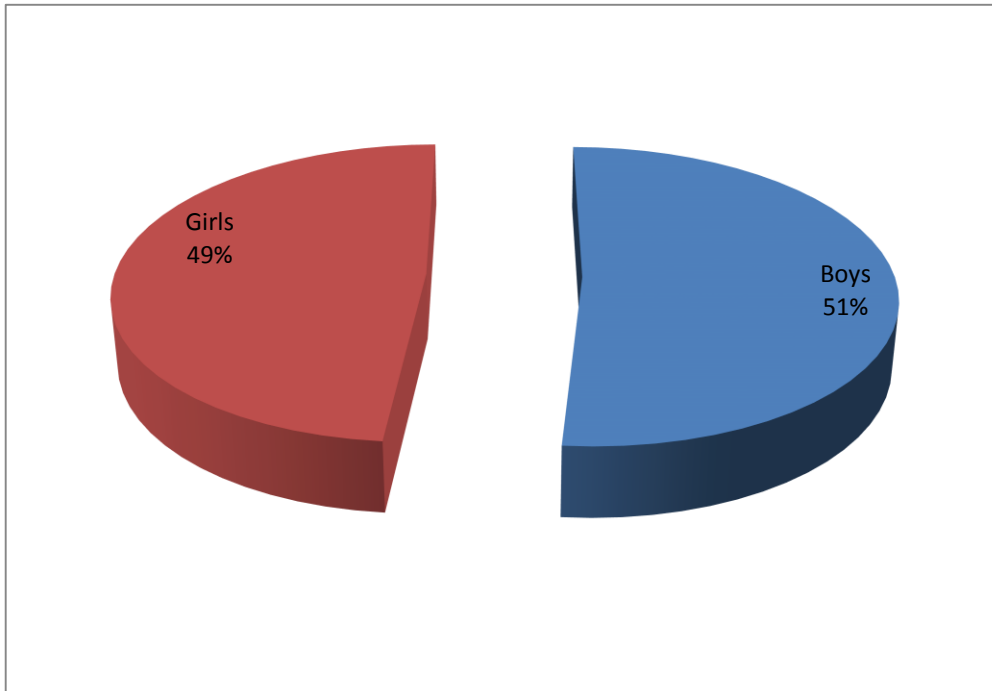


Figure 4.2: Gender of the Learners with Physical Disability

Figure 4.2 shows the gender of learners with physical disabilities who participated in the study. Majority (51%) were boys while minority (49%) was girls. This shows that the number of boys and girls with physical disabilities who participated in adapted aquatics was almost equal.

4.2.2 Class of the Learners

Table 4.1 Class of the learners

Response	Frequency	Percentage
Class 5	11	31.43
Class 6	12	34.29
Class 7	12	34.29

Table 4.2 shows the number of learners who participated in the study per class. 11(31.43%) of the learners were in class 5, 12(34.29%) were in class 6 while the other 12(34.29%) were in class seven. Learners in the lower classes had more participation in adapted aquatics therefore more responses were received.

4.3 Strategies used in Teaching Adapted Aquatics

The first objective was to establish the teaching strategies used in teaching adapted aquatic activities for learners with physical disabilities in Joy Town Special Primary School. Findings are presented in Table 4.2.

Table 4.2 Strategies used in Teaching Adapted Aquatics

Response	Never		Infrequently		Sometimes		Frequently	
	F	%	F	%	F	%	F	%
Use of IEP	1	25.0	0	0.00	2	50.00	1	25.00
Grouping of learners	0	0.00	0	0.00	1	25.00	3	75.00
Remedial adapted aquatics	0	0.00	1	25.00	2	50.00	1	25.00
Aquatic games after school	0	0.00	1	25.00	2	50.00	1	25.00

Responding to whether the teachers and the swimming instructor used individualized education programme when teaching adapted aquatic lessons, a majority (50%) of the respondents used IEP sometimes 1(25%) used it infrequently, while 1(25%) used IEP frequently. Although the formulation and use of individualized education programme when teaching learners with disabilities is reported to be the most effective strategy (Melograno, 2006), the findings indicate that the practice is not fully embraced in the school. This could be attributed to the fact that adapted physical education and aquatic activities are not examinable subjects in primary school hence teachers rarely prepare IEPs. The findings concurred with (Marilyn, 2014) who found out that despite the fact that teachers were trained in special needs education they rarely prepared the IEPs for learners with physical disabilities in adapted physical education classes.

Table 4.2 shows learners were grouped when new swimming skills were taught. Majority (75%) of the teachers grouped the learners according to their physical abilities frequently while minority (25%) of the teacher grouped learners when teaching new swimming skills sometimes. This could be attributed to the fact that the learners with PD had varying levels of functioning. Their abilities require considerations as teachers planned for task analysis as well as skill modifications and adaptations. This shows that teachers put into account the learners' level of performance when teaching the skills. Grouping of learners according to ability allowed for modification of swimming strokes to suit the level of performance of individual learner (Lepore, Gayle, & Stevens, 2007).

On how frequent teachers offered remedial adapted aquatic lessons to the learners, majority (50%) of the teachers said sometimes, 25% said infrequently, while the remaining 25% said that remedial adapted aquatic lessons were offered frequently. Most teachers were unable to offer remedial teaching because they had other teaching duties to attend. In addition learners had to study other subjects and the school routine was tightly scheduled. Due to the limited time allocated to adapted aquatics activities the learners were unable to acquire appropriate skills that would lead to development of physical, emotional, health and social aspects of the learners. From the observation the teachers used task analysis when learners could not comprehend the task given. This was mainly done during break time after the lesson when remedial practice was given to individual learners. The findings concurred with Miller (2012) who stated that teachers should adapt activities through task analysis and remedial teaching in order to encourage successful participation by learners with physical disabilities in PE.

Responding to whether learners were allowed to participate in aquatic games after school, 1(25%) said infrequently, 2 (50%) said frequently while 1(25%) said the learners were allowed to participate in aquatic games after school frequently. Most children did not participate in aquatic games after school because teachers were committed to other duties and the learner could not work on their own. However the swimming instructor allowed learners to have aquatic games after school once or twice a week with her supervision. Participation of aquatic games would offer learners to further practice the skills learnt in the swimming lessons. There is a common belief that learners with handicap are fragile and at a higher risk when in games (Gathua, 1990). Unlike the common belief, performance from Paralympics showed that people with disability can be active, healthy and fit (Frank, 2012). Therefore, each child needs the opportunity to develop fully, physically without discrimination (Sherrill 2012).

4.4 Availability and Adequacy of Equipment

The second objective was to evaluate the availability and adequacy of equipment and resources in Joy town school. Findings were discussed using both frequency and percentage. The results were presented in Table 4.3

Table 4.3: Availability of Facilities and Equipment

Response	Available and adequate		Available but not Adequate		Not available and inadequate	
	F	%	F	%	F	%
Changing rooms	0	0.00	4	100.00	0	0.00
Shower rooms	0	0.00	4	100.00	0	0.00
Non slide desks	0	0.00	4	100.00	0	0.00
Rings	0	0.00	0	0.00	4	0.00
Life jackets	2	50.00	2	50.00	0	0.00
Lockers	0	0.00	0	0.00	4	100.00
Flowing tap water	4	100.00	0	0.00	0	0.00
Floating buoys	0	0.00	0	0.00	4	100.00
Kick boards	0	0.00	0	0.00	4	100.00
Ramps adaptation	0	0.00	4	100.00	0	0.00
Pool lift adaptation	0	0.00	0	0.00	4	100.00
Warm water adaptation	0	0.00	0	0.00	4	100.00

Responding to the availability of other facilities and equipment adapted aquatic activities, all the teachers ranked flowing tap water as available and adequate. Availability of life jacket was second as more than half of the teachers either said they were available and adequate or available but inadequate. The changing rooms, shower rooms and non-slide decks were reported to be available but not well maintained. All other equipment was reported to be available but not adequate. However, rings, lockers, floating buoys and kick boards were not available at all. From the observation there were only two changing rooms, 2 shower rooms, 10 life jackets and 3 flowing water taps against 15 learners with

physical disability per class. This meant that the learner had limited facilities to share during aquatic activities. The observation also showed that rings, lockers, floating buoys and kick boards were not available. This showed that most of the equipment was not available and the available ones were not sufficient to cater for all the learners during the lesson. This corresponded with the response from the administrators who said that the equipment available were not sufficient for the swimming lessons. This could be attributed to the limited availability of funds to procure and establish the equipment as they were not only expensive but also not readily available locally. Additionally, although APE is compulsory in primary schools, it is non-examinable in schools (MOEST, 2003). The subject is thus given lesser emphasis compared to the examinable subjects (Simiyu, 1990). That is mainly because Kenyan curriculum is examination oriented. In so doing the limited funds available are channeled to purchase materials needed in the examinable subjects.

Table 4.4: Maintenance of Aquatic Facilities

Response	Frequency	Percentage
Excellent	0	0.00
Very good	0	0.00
Average	4	100.00
Poor	0	0.00

Responding to the maintenance and condition of the swimming facilities in the school all the 4(100%) of the teachers said that maintenance level was average. This was also supported by the administrators who said that since its construction in 1991 the swimming pool had been modified only twice during routine maintenance. From

observation (using the observation schedule), swimming pool was poorly maintained. Even though the respondents rated the maintenance as average very little improvement had been made to the facility since construction.

This could be attributed to the cost implication required for the maintenance. The findings also agreed with Sherrill (2012) who observed that although adaptive facilities and equipment can greatly improve an individual's quality of life by allowing them to participate in sports and adapted PE, the cost of establishment and maintenance of these facilities are often prohibitive and most of the schools cannot afford these facilities and equipment. This adversely affected the learners' performance and even marginalized others as indicated by Koech (1999). The study further confirmed findings by Gathua (1990) that most of the facilities and equipment were not adapted to meet the needs of learners with SNE. It as well negated suggestions by Koech (1999) which recommended that due to heterogeneity of children with PH there should be specific adaptations at all specific levels of education.

4.5 Teachers Professional Training and Skills

The third object sought to explore whether the teachers of adapted aquatics in the school had relevant professional training. Results were presented in Table 4.5.

Table 4.5 : Teachers Qualification

Teacher qualification		Frequency	Percentage
Master of education	Male	0	0.00
	Female	1	25.00
Bed	Male	0	0.00
	Female	2	50.00
Diploma	Male	1	25.00
	Female	0	0.00

On the teachers qualification, majority (50%) of the respondents, who were female, had acquired a Bachelor's degree, 1(25%) had Master's degree, while the remaining 1(25%), who was male, had a diploma in special needs education. This shows that the teachers had acquired training in special needs. However, swimming is only taught in some universities where PE is offered as subject.

Therefore, the teacher who had diploma qualification had not taken swimming as a course during his training. This shows that some of the teachers were not adequately trained to teach adapted aquatic to learners. Despite the fact that Brock and Lepore (2000) who found out that teachers and instructors in aquatics required extensive training, this has not been the case in the school as most teachers colleges and universities lacked the swimming equipment hence student teachers were taught theoretically. This contradicts the NCLB Act of 2001, which prescribed that all subject teachers should be highly qualified. However, this finding was in agreement with Lorenzi (2008) who reported that a major challenge facing APE was the teaching of APE by individuals with little or no training in specialized education to meet the learners' needs.

Table 4.6: Teachers Length of Service in the School

Length of service	Frequency	Percentage
Less than 1 year	0	0.00
1-5 years	1	25.00
More than 5 years	3	75.00

Table 4.6 shows the teachers length of service in the school. Majority (75%) of the teachers had a service of more five years while 1 (25%) had a service of between 1 to 5 years. This shows that the teachers had gained great experience in teaching learners with physical disabilities. They had also acquired numerous techniques of dealing with challenges encountered when teaching adapted aquatics. Teachers who are experienced provide better services to learners with special needs. This concurs with the findings that as teachers gain experience they are able to reflect on methods, forms and means of teaching, classroom management, pupil evaluation as well as interaction with pupils and between pupils (Liakopoulou, 2012). Reflection on one's teaching enables the teachers to deliver the skills taught better in subsequent lessons and classes (Lee, 2005).

Table 4.7: Extent of Teacher Preparedness

Response	Frequency	Percentage
Inadequate	3	75.00
Fairly adequate	1	25.00
Adequate	0	0.00

Responding to the extent of teacher's preparedness, majority (75%) said that the preparedness was inadequate while the minority (25%) said that preparedness was fairly adequate. This shows that preparations made by most of the teachers before the lesson

were inadequate. This was also evident during the observation as most of the teachers did not have schemes of work and lesson plans for adapted aquatic lessons. Even though lesson preparation brings about higher chances of achievement of lesson objectives, the practice is not fully embraced in the school. This could be attributed to the fact that adapted aquatic activities are not examinable subjects in primary school hence teachers rarely prepared for aquatic lessons. The findings concurred with Marilyn (2014) who found out that despite the fact that teachers were trained in special needs education they rarely adequately prepared for APE lessons.

Table 4.8: Success Rates of New Skills Learnt by Learners

Response	Frequency	Percentage
Above average	0	0.00
Average	1	25.00
Below average	3	75.00

Teachers were asked to rate the success rates of new skills learnt by learners. Majority (75%) of the teachers said it was below average. This showed that in most cases the lesson objectives were not achieved. This could be due to physical and health conditions of the learners. Most learners in the school had severe cerebral palsy and this hindered the learning of new skills due to spasticity and involuntary movements. Cerebral palsy being a neurological condition affects the nervous system, sending faulty and interrupted message. This hence reduces the ability to coordinate unilateral and bilateral arm and leg movement. The inability to maintain full neuromuscular control of the hands and the legs makes it difficult to guide them through correct movement patterns, hence subsequent reduction in swimming efficiency (Sherill, 2012).

Table 4.9: Teaching other Sports

Response	Frequency	Percentage
Yes	3	75.00
No	1	25.00

Responding to whether teachers participated in teaching other sports 3(75%) of the teachers said “Yes” while 1(25%) said “No”. This could be attributed to the fact that those teachers who taught APE were also expected to train children in other sport while the swimming instructor was restricted in teaching children in the swimming pool. Additionally as all teachers were trained, they had acquired skill to teach learners in all sports and games undertaken in primary schools. However refresher courses should be organized to empower teachers with the dynamic changes frequently occurring in the sports.

Table 4.10: Swimming Part of Training

Response	Frequency	Percentage
Yes	3	75.00
No	1	25.00

Responding to whether swimming course was part of the training teachers had undertaken, majority (75%) of the respondents agreed that they had learnt swimming during their study. Teachers undertaking physical education in most universities had swimming as one of the courses offered. However, most teachers colleges rarely use practical approach when teaching swimming to student teachers due to lack of facilities and high number of student teachers.

4.6 Opinion of Learners towards Active Participation in Adapted Aquatics

Objective four sought to explore the opinions of the students towards active participation in adapted aquatics. Results were presented in Table 4.11.

Table 4.11: Swimming Lessons Participated in Last Week.

Lessons	Class	Frequency	Percentage
0	Class 5	2	5.71
	Class 6	1	2.85
	Class 7	0	0.00
1	Class 5	9	25.71
	Class 6	11	31.43
	Class 7	12	34.28

Responding to the number of swimming lessons the learners had participated in the previous week majority (91.43%) participated in one swimming lesson while a minority of 8.57% participated in no swimming lesson. The highest number of learners (5.71%) who never participated in adapted aquatic in the week was in class five while the least was in class seven. Class seven had the highest number of learners who attended swimming lessons while class five had the least.

Table 4.12: Participation in Swimming

Response	Frequency	Percentage
Yes	24	68.57
No	11	31.43

Although learners participated in swimming lessons not all actively participated in the activities. 24(68.57%) said they participated fully in the lessons while 11(31.43%) never actively participated in the activities. The learners who never participated in swimming

lessons was because of their health condition as some had chest problems, were sick and others had spina bifida and were not able to control their bowels, hence could not swim. Others failed to participate because they either did not know how to swim, were absent or were not allowed to do so by the doctor. Additionally, others never participated in swimming lessons because they did not like it and instead went to visit the physiotherapist during the swimming lesson. The findings concurred with Gatwe (2007) who found out that most learners did not have interest in swimming. The findings also supported that of Marilyn (2014) who found out that learners with PD failed to participate in APE due to their physical and medical conditions, attitudes towards physical activities and the limited time allocated to in these activities. This also coincide with finding by Gichia (2009) who found out that the time allocated for APE was not adequate for learners with PD. This was due the reason the learners had to change, move to the pitch and later be allowed time to change in preparation for the next lesson. This made the learners participate in APE for only around 10 minutes. As swimming required more preparation as learners change to the swimming costumes, take a shower and then join others in the lesson for the day most learners found it laborious hence opted out of the lesson.

Table 4.13: Swimming Strokes Learners Preferred

Response	Frequency	Percentage
Butterfly	2	5.71
Breast stroke	7	20.00
Back crawl	7	20.00
Front crawl	19	54.29

Responding to the swimming strokes the learners preferred majority (54.29%) preferred front crawl. 5.72% preferred back crawl, while breast stroke and butterfly were preferred by 20.00% each. Although the learners had preferred swimming strokes, modification was necessary. Most of the learners were unable to perform the preferred strokes. It is therefore paramount that the swimming strokes should be modified to suit the learners' abilities (Lopore & William, 2007). As noted by Sherrill and Dummer (2012) the swimming strokes and techniques for individuals with disabilities should focus on the principle of minimize drag, increase propulsion and improve physical fitness. Use of pool buoy, leg floater and even stretch cords may also help in training learners with PH swimming stroke (Colwin, 2012).

4.7 Challenges Facing Adapted Aquatics

The last objective sought to find out the challenges facing the instruction of Adapted Aquatics in the school.

4.7.1 Availability of Instructional Materials for Adapted Aquatics

The study found out that there was no teachers' guide, pupil's books or any reference materials on Adapted Aquatics in the school. It was observed that the school had PE syllabus and rulebooks for most of the sports including swimming which were old and outdated. This could be attributed to the few PE books that have been approved by the Ministry of education in comparison to books in other subjects. Additionally there is no Adapted aquatic book or syllabus approved by the ministry at any level of education. The findings were in agreement with those of Gichia (2009) who found out that APE lack the required books.

4.7.2 Time Allocated for Aquatic Activities

Table 4.14: Times Allocated to learners during the Adapted Aquatics

Response	Frequency	Percentage
Yes	12	34.29%
No	23	65.71%

When learners were asked whether the time allocated for swimming was enough, minority (34.29%) of the respondents said “Yes” while the majority (65.71%) said no. Majority of the learners felt that the time allocated for swimming was not adequate. This was due to the limitation in functioning which made them to take more time before successfully learning the new skills taught. Most learners had severe orthopedic impairment that adversely affected their mobility as well as educational performance. Some learners also could not access the swimming pool on wheelchairs promptly as the school did not have teacher aides and spotters. From the observation made the actual Adapted Aquatic lesson took 20 minutes as the preparation for the next lesson after APE took almost 10 minutes. This concurred with the findings by Gichia (2009) who found out that time allocated for APE in Joy Town Secondary school was not sufficient for the learners to adequately gain knowledge of the skills taught.

4.7.3 Availability of Spotters and Teacher Aids

Table 4.15: Availability of Spotters and Teacher Aids

Response	Frequency	Percentage
More than adequate	0	0.00
Adequate	0	0.00
Inadequate	1	25.00
Not available	3	75.00

Responding to whether spotters and teacher aids was adequate, majority (75%) of the teachers said they were not available while a minority of 25% said they were inadequate. Although the school had a limited number of teacher aids and spotters, they were assigned duties in classes as well as in the dining hall. Due to this the spotters and teacher-aids had limited or no time at all to be available during aquatic activities lessons as they were engaged in other duties.

Other challenges noted by Awosika (2009) to be affecting adapted aquatics were lack of sufficient swimming equipment and lack of lifeguards in the school. The school administration also stated that the school never participated in galas due to lack of funds and inappropriate preparations. Additionally, the multidisciplinary teams were rarely involved in the swimming lessons. The school also faces the challenge of buying pool chemicals, paying workers to clean the pool and teachers feeling inadequate to handle aquatic activities.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter entails the summary of the findings, conclusions and recommendations.

5.2 Summary

The study was conducted in Joy Town Special Primary School in Thika Municipality, Kiambu County, Kenya. The purpose of the study was to establish the influence of instructional resources on participation in adapted aquatic activities among learners with physical disabilities. The study sought to:

- i. Investigate the strategies used in teaching Adapted Aquatics.
- ii. Find out the availability and adequacy of facilities and equipment used when teaching Adapted Aquatics.
- iii. Explore whether the teachers of Adapted Aquatics in the school have the relevant professional training.
- iv. Explore the opinions of students towards active participation in Adapted Aquatics.
- v. Find out challenges facing the instruction of Adapted Aquatics

The study targeted a total of 62 learners from classes 5-7, three administrators that the head-teacher, deputy head-teacher, and the senior teacher, three teachers handling Adapted Physical Education and one swimming instructor making a population of 69 respondents. A sample size of 42 participants which was 60.87% of the target population was selected. The data was collected using observation checklist, questionnaires and interviews. The following is a summary of the study findings:

5.2.1 Strategies used in teaching adapted aquatics

The strategies used by APE teachers in Joy Town Special Primary School for Physically impaired included use of IEPs which was used frequently by a quarter (25%) of the teachers while majority either used it sometimes or never prepared the IEPs at all. Teachers offered remedial adapted aquatic lessons to the learners. The study revealed that all the teachers offered remedial lessons to the learners although it was not planned regularly. Only a minority of 25% of the teachers offered remedial teaching frequently. To enhance practice of the skills learnt during the aquatic activities lesson, the teachers allowed learners to participate in aquatic games after school. However, this was not adequate as only a quarter of the teachers' engaged learners in aquatic games after school frequently.

5.2.2 Availability and Adequacy of Equipment

The study found out that the instructional materials were not sufficient in the school. This was supported by all the teachers, the administrators during the interview and the observation made from the observation schedule. On the maintenance and condition of the swimming facilities in the school all the 4(100%) of the teachers said that maintenance level was average. This was also supported by the administrators who said that since its construction in 1991 the swimming pool had been modified only twice during routine maintenance. From observation (using the observation schedule), swimming pool was poorly maintained. Even though the respondents rated the maintenance as average very little improvement had been made to the facility since construction. Limited adaption and modification had been done to the swimming pool. All the teachers ranked flowing tap water as available and adequate. This was followed

by life jacket ranked, changing rooms and shower rooms which were available but not adequate while rings, lockers, floating buoys and kick boards were not available at all. The observation showed that rings, lockers, floating buoys and kick boards were not available. This showed that most of the equipments were not available and the available ones were not sufficient to cater for all the learners during the lesson.

5.2.3 Teachers Professional Training and Skills

The study also sought to find out the teachers' professional training and skills acquired. It was found out that half (50%) of the teachers, who were female, had acquired a bachelor degree; a quarter had master degree, while the remaining had a diploma in special needs education. Teachers had an experience of teaching aquatic activities to the learners with PH as majority had a service of more five years. Majority (75%) of the teachers grouped the learners according to their physical abilities when teaching new skills.

The teacher's preparedness to teach Adapted Aquatic was evaluated. It was found out that majority (75%) said that the preparedness was inadequate while the minority (25%) said that preparedness was fairly adequate. This was also evident during the observation as most of the teachers did not have schemes of work and lesson plans for adapted aquatic lessons. Majority of the teachers rated the success rate of skills taught in each APE lesson as below average. It was also found out that majority of the teachers participated in teaching other sports in the school and had learnt swimming during their study in the university.

5.2.4 Opinion of Learners towards Active Participation in Adapted Aquatics

On the number of swimming lessons the learners had attended in the previous week majority (91.43%) attended one swimming lesson while a minority of 8.57% attended no swimming lesson. The highest number of learners (5.71%) who never attended adapted aquatic in the week was in class five while the least was in class seven. Class seven had the highest number of learners who attended swimming lessons in that week. Although learners attended swimming lessons not all participated fully. Over two thirds (68.57%) had participated in the lessons while less than a third (31.43%) never participated. the study also found out that swimming strokes preferred by majority (54.29%) of the learners was front crawl. 5.72% preferred back crawl, while breast stroke and butterfly was preferred by 20.00% each. Majority (65.71%) of the learners felt that the time allocated for adapted aquatic activities was not adequate. From the observation made, the actual Adapted Aquatic lesson took 20 minutes as the preparation for the next lesson after APE took almost 10 minutes.

5.2.5 Challenges facing Adapted Aquatics

The study found out that there was no teachers' guide, pupil's books or any reference materials on Adapted Aquatics in the school. It was observed that the school had PE syllabus and rulebooks for most of the sports including swimming which were old and outdated. Majority (75%) of the teachers said that spotters and teachers aids were not available during APE lessons. Other challenges noted to be affecting adapted aquatics were lack of sufficient swimming equipment and lack of life guards in the school. The school administration also stated that the school never participated in galas due to lack of funds and inappropriate preparations. Additionally the multidisciplinary teams were

rarely involved in the swimming lessons. The school also faces the challenge of buying pool chemicals, paying workers to clean the pool and lack of qualified teachers to handle swimming.

5.3 Conclusion

Based on the study findings, the following conclusions were made;

The strategies used in teaching adapted aquatic lessons included use of IEP, preparation of remedial aquatic lessons, grouping of learners and use of aquatic games after class work where learners rehearsed the learnt skills. Instructional materials for adapted aquatic activities were found to be insufficient. Additionally, the maintenance and adaptation of the available physical equipment was below average. The study revealed that teachers were adequately trained to teach APE and had immense experience in teaching. The teachers were also involved in other sports.

The study also revealed that some learners never participated in swimming lessons. Some learners had negative opinions toward the sport. The preferred swimming strokes among the learners were backstroke, breast stroke, free style and butterfly. There were numerous challenges faced when teaching adapted aquatics activities. The challenges included inadequate facilities, lack of sufficient swimming equipment, lack of funds to organize swimming galas and lack of collaboration of the multidisciplinary teams in the swimming lessons.

5.4 Recommendations

From the study findings the following recommendations were made:

- i) Resources and facilities required in the Adapted Aquatic activities should be availed to the schools that have learners with PH. This calls for all stakeholders to source for funds so as to provide adequate facilities and equipment for adapted aquatic lessons.
- ii) Physical education teachers and students in Special Primary Schools should be sensitized on the need to construct physical education facilities and improvise equipment.
- iii) To cater for the individual needs for learners with physical disabilities, the swimming pool and other facilities should be adapted and modified. This call for school administration to erect ramps and pool lifts for easy entry into the pool this will enhance full participation of learners with physical disabilities in Adapted Aquatics.
- iv) Indoor facilities should also be constructed to cater for the learners during the rainy season. This also calls for warm water services in the swimming pool so as learners can enjoy more. Warm water is known to improve muscle strength and relieve pain (Sherrill, 2012)
- v) Instructional materials in adapted aquatics should be availed. The school should prioritize in purchasing these materials and also partner with other stake holders like the county government, NGOs, religious based organizations and the community.

- vi) School administrators should be equally sensitized on the need and importance of physical education and sports facilities in schools. This could be achieved through workshops for school principals.
- vii) The policy implementers and monitors should ensure that adapted PE is taught and that the time allocated for it is not used for making up lessons of the examinable subjects like Math and English.

5.5 Recommendation for Future Research

Based on the findings and conclusions, the following research studies:

- i) This study only concentrated on one school and therefore a similar study involving more special schools is needed. This would help establish a comprehensive finding based on comparative studies.
- ii) The study majorly focused on physical facilities and participation on adapted aquatics. Hence, there is need to conduct a study focusing on how other parties like significant others including parents, friends, teachers and peers influence the participation of learners with physical disabilities in adapted aquatics.
- iii) Other factors like attitudes of teachers are important in relation to participation of learners with disabilities, yet were not focused in this study. Therefore, there is need to carry out a study on the influence of teachers' attitudes on participation in an inclusive adapted aquatic programs.

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APPENDICES

Appendix I: Questionnaire for Learners

Please tick the response you think is correct

1. Which class are you in? 5 6 7
2. Do you participate in swimming lessons? yes No
If no explain why _____
3. How many swimming lessons do you have per week?
0 2 1 others
4. Do all your classmate participate in swimming?
Yes No
5. If no please state why _____
6. Which swimming stroke are you comfortable in?
Back crawl Front crawl Breaststroke Others
7. Is time allocated for swimming in every lesson enough?
Yes No
8. About how many of you share the swimming pool at each swimming lesson?
5 10 More than 10
9. Compared to other sporting activities how do you rate swimming?
Best Good Bad
Worst

APPENDIX II: QUESTIONNAIRE FOR ADMINISTRATOR

1. Gender Male Female

2. Position
Head teacher D/head teacher Senior teacher

3. How many years have you been in this institution?
Less than 1 year 1-5 years More than 5 years

4. Please indicate your highest level of education and training

- A. Masters degree
- B. Bachelor's degree
- C. Diploma course
- D. Certificate
- E. Others

5. When was this swimming facilities constructed_____

6. Since its construction has there been any modification to make it suitable for all learners?

Yes No.

7. Do learners enjoy warm water in the pool?

Yes No

If no please explain why?

8. What is the maintenance status of the facilities and equipments for adapted aquatics?

Excellent Very good
Average Poor

9. Does the school have sufficient equipment to cater for all learners during the swimming lesson?

Yes No.

10. Are there life guards at the pool?

Yes No.

11. What is your assessment of the adequacy of equipment and facilities for teaching adapted aquatics?

Adequate
More than adequate
Inadequate

12. Is there a school team that participate in swimming galas?

Yes No

If no please explain why _____

13. Indicate how often the swimming lessons are collaborated with other multidisciplinary team member like the hydrotherapists.

A. Infrequent
B. Frequent
C. Sometimes
D. Never

14. What problems do you encounter if any in acquiring, equipment, instruction materials or personnel for teaching adapted aquatics?

1. _____

2. _____

3. _____

4. _____

5. _____

APPENDIX III: QUESTIONNAIRE FOR APE TEACHERS AND SWIMMING

INSTRUCTORS

1. Gender Male Female
2. Position APE teacher Swimming instructors
3. How long have you been in this institution?
Less than year 1-5 years More than 5 years
4. Indicate your highest level of qualification
- A. Master's degree
- B. Bachelor's degree
- C. Diploma course
- D. Certificate
- E. State others
5. Do you teach any other sport?
Yes No.
6. Was swimming or any other aquatic activity included in your course of study during training?
Yes No
7. In terms of your training please indicate the extent to which it has prepared you in handling adapted aquatics
- A. Inadequate
- B. Fairly
- C. Adequate

8. How often do you use IEP in your lesson plan?
- A. Infrequent
- B. Sometimes
- C. Frequent
- D. Never
9. Do you have sufficient instructional materials like the swimming guide?
- Yes No.
10. How would you rate the clarity of swimming objectives as far as they are stated in the syllabus?
- A. Clearly stated
- B. Not sure
- C. Very clearly stated
- D. Vague
11. Learners with physical disabilities will require extra teaching. How often do you use remedial and repetition in adapted aquatic class?
- A. Infrequent
- B. Sometime
- C. Frequently
- D. Never
12. What is the maintenance status of the facilities and equipment?
- | | | | |
|-----------|--------------------------|-----------|--------------------------|
| Excellent | <input type="checkbox"/> | Very good | <input type="checkbox"/> |
| Average | <input type="checkbox"/> | Poor | <input type="checkbox"/> |

13. How is the swimming pool adapted to cater for safe entry and exist for learners with the severe physical disabilities?

Ramps None
Pool lifts State others

14. Are there enough changing rooms and cabinets for the learners?

Yes No

15. What is the average number of learners that you handle each lessons?

5 10 More than 10

16. How do you group the learners when teaching a new skill?

Age Sex ability

17. Do all learners record success in the skills taught?

Yes No.

If no give a brief explanation _____

18. Do you have support of teacher aid or spotters?

Yes No

If no please give an explanation _____

19. Apart from scheduled lessons do you have aquatic games after school?

Yes No

20. Please rank the problems you experience when teaching adapted aquatic

- | | |
|---|--------------------------|
| Inadequate equipment and facilities | <input type="checkbox"/> |
| Facility not modified appropriately | <input type="checkbox"/> |
| Inadequate knowledge in adapted aquatics | <input type="checkbox"/> |
| In appropriate syllabus | <input type="checkbox"/> |
| In adequate time | <input type="checkbox"/> |
| Learner's disability | <input type="checkbox"/> |
| Negative attitude by learners | <input type="checkbox"/> |
| Lack of indoor facility | <input type="checkbox"/> |
| Lack of instructional materials in adapted aquatics | <input type="checkbox"/> |

APPENDIX IV

INSTRUCTIONAL FACILITIES AND EQUIPMENT OBSERVATION

CHECKLIST

	Available	Not Available	Number of Items
Facilities / Swimming pool			
Changing rooms			
Shower rooms			
Non Slide Decks			
Kicks Board			
Rings			
Life Jackets			
Lockers			
Flowing tap water			
Syllabus			
Textbooks			
Teacher's guide			
APE Teachers			
Spotters			
Life guard			
Horizontal bars			
Floating buoys			

APPENDIX V

INTERVIEW GUIDE FOR ADMINISTRATORS

1. What is your professional qualification as a teacher?
2. Do you have any training in special needs education?
3. How many teachers' are trained in Special Needs Education, Adapted PE?
4. How many swimming instructors does the school have?
5. How many teacher aides and spotters does the school have?
6. Does the school have a swimming pool well adapted to the needs of all learners?
7. How often do learners participate in aquatic activities?
8. How often do you hold swimming galas in the school?
9. How do you maintain the aquatic facilities and equipment in your school?
10. What are the major challenges facing the implementation of Adapted aquatics
11. How do you cope with these challenges?

APPENDIX VI

EQUIPMENT OBSERVATION CHECKLIST ANALYSIS

	Available	Not Available	Number of Items
Facilities / Swimming pool	✓		1
Changing rooms	✓		2
Shower rooms	✓		2
Non Slide Decks	✓		1
Kicks Board		✓	0
Rings		✓	0
Life Jackets	✓		10
Lockers		✓	0
Flowing tap water	✓		3
Syllabus	✓		1
Textbooks		(none for A.A)	0
Teacher's guide			0
APE Teachers	✓		3
Spotters		✓	0
Life guard		✓	0
Horizontal bars	✓		2
Floating buoys		✓	0

APPENDIX VII

RESEARCH AUTHORIZATION INTRODUCTION LETTER



**KENYATTA UNIVERSITY
GRADUATE SCHOOL**

E-mail: kubps@yahoo.com
dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 8710901 Ext. 57530

Our Ref: E55/CE/22955/10

Date: 13th December, 2014

The Principal Secretary,
Higher Education, Science & Technology,
P.O. Box 30040,
NAIROBI

Dear Sir/Madam,


RE: RESEARCH AUTHORIZATION FOR MS. AGNES W. GITAHU -REG. NO. E55/20342/12

I write to introduce Ms. Gitahi who is a Postgraduate Student of this University. She is registered for a M.Ed. degree programme in the Department Special Needs Education in the School of Education.

Ms. Gitahi intends to conduct research for a thesis Proposal entitled, "Analysis of Instructional Needs and Resources for Adapted Aquatics Activities; The Case of Joy – Town Special School Kiambu County Kenya".



Any assistance given will be highly appreciated.


Yours faithfully,


MRS. LUCY N. MBAABU
FOR: DEAN, GRADUATE SCHOOL

JMO/cao

**APPENDIX VIII
RESEARCH PERMIT**

<p align="center">CONDITIONS</p> <ol style="list-style-type: none"> 1. You must report to the County Commissioner and the County Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit. 2. Government Officer will not be interviewed without prior appointment. 3. No questionnaire will be used unless it has been approved. 4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries. 5. You are required to submit at least two(2) hard copies and one (1) soft copy of your final report. 6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice 	 <p>REPUBLIC OF KENYA</p> <hr/>  <p>National Commission for Science, Technology and Innovation</p> <p>RESEACH CLEARANCE PERMIT</p> <p>Serial No. A 10588</p> <p>CONDITIONS: see back page</p>
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<p>THIS IS TO CERTIFY THAT: MISS, AGNES WANGUI GITAHI of KENYATTA UNIVERSITY, 43844-100 Nairobi, has been permitted to conduct research in Kiambu County</p> <p>on the topic: ANALYSIS OF INSTRUCTIONAL NEEDS AND RESOURCES FOR ADAPTED AQUATICS ACTIVITIES: THE CASE OF JOY-TOWN SPECIAL SCHOOL KIAMBU COUNTY KENYA</p> <p>for the period ending: 11th August, 2017</p> <p><i>Agnes Wangui Gitahi</i> Applicant's Signature</p>	<p>Permit No : NACOSTI/P/16/99235/13120 Date Of Issue : 11th August, 2016 Fee Received : Ksh 1000</p>  <p><i>Director General</i> Director General National Commission for Science, Technology & Innovation</p>
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APPENDIX IX

RESEARCH AUTHORIZATION



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349, 3310571, 2219420
Fax: +254-20-318245, 318249
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Website: www.nacosti.go.ke
when replying please quote

9th Floor, Utali House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref. No.

Date:

NACOSTI/P/16/99235/13120

11th August, 2016

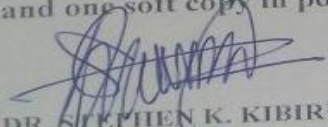
Agnes Wangui Gitahi
Kenyatta University
P.O. Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*Analysis of instructional needs and resources for adapted aquatics activities: The case of Joy-Town Special School Kiambu County Kenya*," I am pleased to inform you that you have been authorized to undertake research in **Kiambu County** for the period ending **11th August, 2017**.

You are advised to report to the **County Commissioner and the County Director of Education, Kiambu County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.


DR. STEPHEN K. KIBIRU, PhD.
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Kiambu County.

The County Director of Education
Kiambu County.