INFLUENCE OF PRIMARY TEACHER TRAINEES' PHYSICAL EDUCATION PEDAGOGICAL CONTENT KNOWLEDGE ON THEIR LEARNERS' COMPETENCE DURING TEACHING PRACTICE: A STUDY OF PRIMARY TEACHERS' TRAINING COLLEGES IN KENYA

BY

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A THESIS SUBMITTED TO THE SCHOOL OF EDUCATION IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF DOCTOR OF PHILOSOPHY IN EDUCATION COMMUNICATION AND TECHNOLOGY

MOI UNIVERSITY

2024

DECLARATION

Declaration by Candidate

This thesis is my own original work and has not been presented for a degree in any other university. No part of this thesis may be reproduced without the prior permission of the author and/or Moi University.

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DEDICATION

I dedicate this work to my late parents Mr. Chimungeni A. and Mrs. Loice Chimungeni; greatly egged me on as I worked towards the completion of the work. To my immediate family, my husband Raymond Philip Onyango and our children Arnold, Annabelle and Allen to you I dedicate this work for constantly urging me on even when it appeared a tall mountain to climb.

ACKNOWLEDGEMENT

I wish to thank God the Almighty for the gift of healthy life, patience and the energy that propelled all my efforts in the course of my study and during the period of writing this thesis. I am equally highly indebted to my supervisors for their rigorous guidance through sacrificing their time and providing input which shaped the study. I wish to acknowledge my two supervisors, Prof. Ongeti and Dr. Agumba, for their tireless support. All the lecturers from the Department of Curriculum Instruction and Educational Media, Moi University played a big role in the course of the studies and I remain forever grateful. The opportunity to share experiences with my classmates and colleagues was extremely enriching and availed their input in broadening my horizon. May I equally thank all the participants who painstakingly sacrificed to share with me their experiences and allowed me to interrogate their insights in order to generate the ideas that went into the production of this thesis. Your efforts and input shall remain forever immeasurable. I wish to thank my husband R.P. Onyango and our children Arnold, Annabelle and Allen for always standing by me even when the going got so tough. Their presence in my life remained a pillar on which I learned pricelessly. To all those who in one way or another provided kind words of encouragement and those who took time to critique the document before publication I say a big thank you to you all. May your labours never be in vain.

ABSTRACT

Quality Physical Education provides a range of experiences geared towards developing skills and knowledge relevant to the 21st century by instilling a positive attitude towards physical activity, academic performance and reducing the chances of young people from engaging in risky behavior. This study sought to determine the influence of Primary teacher trainees Physical Education pedagogical content knowledge on their learner's competence during teaching practice. This was achieved through the study objectives; to determine the adequacy of content covered in the Physical Education curriculum for teacher education; to assess teacher trainees views on the content of the Physical Education curriculum for teacher training; to evaluate the resources for teaching Physical Education in teacher training colleges; and assess the effectiveness of trainees' pedagogical content knowledge for curriculum delivery in primary schools during teaching practice; examine the challenges encountered by trainees in teaching Physical Education in primary schools during teaching practice. The study was based on Banduras Social Cognitive theory and adopted a mixed methods approach. The target population comprised of Teacher trainers and second year teacher trainees from both private and public primary teacher training colleges from Western Kenya. These were sampled through purposive sampling and stratified simple random sampling techniques which yielded 18 trainers and 483 trainees. Data for the study was collected through questionnaires for the teacher trainees, interviews with selected trainers and classroom observation of physical education lessons. A resource checklist was used to evaluate the resources for Physical Education. Quantitative data was statistically analysed to determine the means and percentages and presented using tables and charts. Qualitative data was analysed and presented thematically based on the research objectives. The conclusions of the study were; content covered in the Physical Education was adequate but there are aspects that are not adequately covered; the teacher trainees demonstrated competence in Physical Education pedagogical content knowledge, though there were disparities amongst them; though most facilities were available they were poorly maintained; teacher trainees faced challenges including inadequate time for various courses such as teaching practice, inadequate teacher trainers and inadequate facilities and equipment. The study recommendations were; the Ministry of Education consider increasing the training period to more than two years; the Ministry of Education allocate more time for teaching practice; the Kenya Institute of Education and Teachers Service Commission should provide in-service training on pedagogical content knowledge for Physical Education and other subjects; Teacher Training Colleges should allocate more resources in purchasing and maintenance of equipment and facilities for Physical Education respectively. The study should be able to broaden practitioners' knowledge on Physical Education curriculum both for teacher training and teaching in schools.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

CK	Content Knowledge
EFA	Education for all
GMR	Global Monitoring Report
ICT	Information Communication Technology
KESSP	Kenya Education Support Programme
KCSE	Kenya Certificate of Secondary Education
KICD	Kenya Institute of Curriculum Development
KIE	Kenya Institute of Education
KNEC	Kenya National Examinations Council
MKO	More Knowledgeable Other
MoE	Ministry of Education
NESSP	National Education Sector Plan
PCK	Pedagogical Content Knowledge
PE	Physical Education
PTE	Primary Teacher Education
PTTCs	Primary Teachers Training Colleges
QPE	Quality Physical Education
RTI	Research Triangle International
TCF	Teacher Competence Framework
TE	Teacher Education
TP	Teaching Practice
UNESCO	United Nations Education, Scientific, Cultural Organization
WHO	World Health Organization
ZPD	Zone of Proximal Development

CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 Introduction

The role of Teacher Education programs is critical in developing professional teachers who are capable of handling learning in the 21st Century. Subject content, pedagogical practice and school based experiences contribute to the student teacher's acquisition of knowledge, skills and attributes necessary for them to teach effectively in the school system. Thus, Physical Education Teacher Education programs should provide relevant experiences to help the student teacher understand the scope of their role in enabling learners achieve the designed learning outcomes.

In this chapter, an overview of the role of Physical Education is discussed in light of the national and global expectations and international commitments. The 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, justification of the study, scope of the study, limitations of the study, theoretical frame work, conceptual frame work, assumption of the study and definition of operational terms.

1.2 Background of the Study

Enhancing the quality of education is a key policy objective in many countries, geared towards effectively developing learner's competencies, and helping them reach their full potential (OECD, 2015). Amongst the variety of strategies and initiatives is improving Teacher Education (GOK, 2019) also referred to as Initial Teacher Education and Pre-Service Teacher Education (OECD, 2015) and Pre-Service Teacher Education (GOK, 2020). Studies investigating structural features of Teacher Education on teaching quality have continually demonstrated the importance

of substantive aspects such as course content, relating theory to practice and providing opportunities for reflection (Darling-Hammond, 2006).

Teaching is defined as a process of providing learners with opportunities for learning, appreciating learner's achievements and limitations and making informed decisions on how best to support the learners (Maldez & Adella, 2007). Thus, Teacher Education, when viewed as a pathway, includes policies relating to selection of candidates, progression within a course, graduation requirements, registration and employment, induction and early career development (Roberts-Hull, Jensen and Cooper, 2015). Pre-service Teacher Education, therefore, often focuses on two strongly inter-related factors namely: equipping the student teachers with appropriate knowledge and skills, and ensuring that this happens within high quality standards.

Quality Physical Education (QPE) has been shown to provide many benefits including instilling a positive attitude towards physical activity, decreasing the chances of young people engaging in risky behavior and to impact positively on academic performance as well as providing a platform for wider social inclusion. Physical Education, therefore, provides a range of experiences that enable young people to develop skills and knowledge needed to make the most of all the opportunities including shaping new forms of global citizenship. In this regard, PE provides a gateway to grow the skills required for success in the 21st Century (UNESCO, 2015).

Increasing evidence from empirical studies shows that physical activity and exercise have a positive influence on heart related outcomes. These include a better quality of life, reduced risks of a variety of diseases, psychological and emotional benefits. Globally, nations have embraced Physical Education and Sport for Development as

"one of the most effective means of providing children and youth with skills, attitudes, values, knowledge and understanding for life-long participation in society". (Mineps, 2013). Kenya is implementing the Competency Based Curriculum with a mission, "to nurture every learner's potential" by identifying individual talents. Physical education is central to the realization of this mission (BECF, 2017).

The Competency Based Curriculum for Basic Education in Kenya seeks to increase the learners' acquisition of 21st Century skills namely: Communication and Collaboration, Critical thinking and Problem solving, Digital Literacy, Citizenship, Learning to Learn and Self-efficacy. Physical Education in Basic Education has been elevated to an examined subject from Early Years of Education level, through Middle School and culminating into the Sports Pathway in Senior School (BECF, 2017). Thus, Physical Education is deemed to offer the opportunity for all these skills to be acquired (Sport, 2021). Subsequently, the Competency Based Teacher Education Curriculum is also being implemented to ensure competent teachers are trained (GOK, 2021).

To further the role of Physical Education, World Health Organization (WHO) links with school-based education to advocate for school and community engagement in the promotion of physical activity among children and adolescents with the view to eliminate the risk factors for chronic diseases that are associated with adult morbidity and mortality (WHO, 2004). Participation in regular physical activity improves children's muscular strength and endurance, flexibility, body posture and cardiovascular endurance leading to improved levels of physical fitness (Kahiga, 2014).

In spite of the power recognized for Physical Education, there has been a global decline in classroom delivery. An international survey conducted in some African countries revealed that the status of PE was low and the subject was in danger of being sidelined. According to Ajisafe (1997), the implementation of PE in African schools has faced a lot of setbacks. The challenges in the provision of PE included pressure for good academic performance, inadequate time allocation, inadequate and poor state of learning facilities and equipment, lack of well trained teachers and poor attitude from teachers, learners and parents towards PE (Hardman 2008; DiForce, 2010).

Pedagogical Content Knowledge (PCK) is the teacher's ability to instructionally adapt content to the student's diverse abilities. The Teacher Education curriculum is largely driven by policy and professional standards to influence what to teach and how to teach. Shulman (1987) connected the two in his construct PCK, conceptualized as amalgamation of Content Knowledge and Pedagogical Knowledge. These influence understanding of *how* the subject matter is "organized, represented and *adapted* to the diverse interests and abilities of learners and presented for instruction" (Shulman, 1987, p.8).

Shulman (1987) identifies seven knowledge bases, which form the minimum knowledge for teaching. These knowledge bases include: Content knowledge also called subject matter knowledge. General pedagogical knowledge; Curriculum knowledge (CK); Pedagogical Content Knowledge (PCK), Knowledge of learners and their characteristics, Knowledge of educational contexts and Knowledge of both short and long-term goals, values and purposes of education and of a subject. This framework is commonly used in research about knowledge for teaching in general

and in physical education in particular, with many studies focusing on Pedagogical Content Knowledge (Newton and Newton, 2001).

Over the past 25 years, PCK has become widely accepted as a useful construct in understanding the unique nature and development of teachers' knowledge. PCK research in the field of Teacher Education has rapidly accumulated. There is consensus in literature about the importance of the construct in bringing together specific types of knowledge that teachers require to support effective student learning of particular subject matter. Nevertheless, questions still remain about how PCK can be understood, developed and organized in the context of Initial Teacher Education.

The development of PCK has been the subject of studies in different programme formats of Teacher Education, at different levels (primary and secondary), in different subjects and in various countries. From these studies, it is apparent that whatever the organizational format of the programme, the development of PCK should be related to pre-service teachers' Subject Matter Knowledge on the one hand, and their teaching experiences, notably during practicum, on the other. Equally, developing PCK requires pre-service teachers' ability and willingness to view subject matter from a learners' perspective.

The teacher's adaptation of instruction for individual pupils differs when teaching varied instructional units. The clarity with which learners understand the task, and the extent to which the teacher holds them accountable mediate the learner's performance (Siedentop, 1991). Rink (2010) described content development is perceived in terms of the task purpose where the teacher begins the lesson content development with an initial task for learners to perform. (Rink (2010) referred to this as an *informing* task. In this model, as the learners perform the task, the teacher's response may be as

follows; a) *extend* the task by creating more or less difficult conditions; b) *refine* the task by which will attract varied teachers' responses based on eh nature of learners' performance.

The task systems and content development allow for adaptations which is a reflection of PCK. However, they do not offer a complete picture of a particular instructional episode of a teacher providing adaptation. The teacher's ability to transform content knowledge comprehensively to pupil's varied abilities and backgrounds is a defining feature of adapting content to learner's needs. Deepening teachers' subject matter knowledge is a documented way to improve teaching since teachers who have demonstrable expertise in a subject matter are more comfortable and enthusiastic in their work.

Debate has arisen on what the primary focus of Physical Education courses should be. Debates have centred on whether to acquire information and skills that are related to the activity or to teach relevant activities. While some Teacher Education programmes have attempted to incorporate both approaches, others contend that the stronger emphasis should be on pedagogical skills rather than Subject Content Knowledge. However, teachers who enhance their understanding of subject matter develop more elaborate strategies to teach their subject area. The current study focused that sound subject matter knowledge as a foundation for developing relevant Pedagogical Content Knowledge.

In Physical Education, the main objective is the acquisition of motor skills which is demonstrated by the outcomes of the learner's performance. Proficiency in motor skills leads to confidence and results in more competent performance during sport and recreational activities. In one example, Barnett et al. (2011) found that children who

develop proficient object control skills (e.g., throwing, catching, and kicking) were more likely to become physically active later in life. Overall, there is ample evidence to support the link between motor skill development during childhood and long-term physical activity (Lopes et al., 2010; Okely et al., 2001; Wrotniak et al., 2006).

Studies on teacher performance have shown that there is a link between learner achievement and the skills and competencies of teachers. Professional qualifications include subject content knowledge for transfer to learners and pedagogical content knowledge which empowers the teacher with the methods and practice of teaching, thus facilitating understanding and responding to learners needs (Bobis, 2007; Khatib and Fat'hi, 2012). According to Schempp et al. (1998), subject area specialists are also better able to plan lessons that are richer in activities, develop contingency plans that accommodate classroom variations, assess learning difficulties, and devise remedies to those difficulties to enhance the learner's performance.

In addition, Kinoo (1999) stresses that teaching methods and materials are not ends in themselves. Their use should be accompanied by appropriate learning activities, which are the key to success in the learning of PE. The teacher has the responsibility of tailoring the content, the teaching methods and materials around suitable learning activities which will enhance the learner's acquisition of the intended skills. This lays emphasis on the need for subject knowledge and pedagogical content knowledge to facilitate effective teaching of Physical Education. This notion gives credit to the essence of this study on the influence of primary teacher trainees' Physical Education pedagogical content knowledge on their learners' competence during teaching practice.

1.2.1 Context of the Study

Sports and physical education have been declared fundamental rights for all and an essential part of education since 1978. Emphasis has been laid on the need to train all personnel who assume professional responsibility for physical education and sport, including teachers. Physical Education is a compulsory subject in the Kenya curriculum at Basic and Teacher Education having been declared through a Presidential Decree (GOK, 1980). These are critical developmental levels when the benefits of physical activity, sports skills, rules and regulations can be practiced with the intention of encouraging children to adopt and lead healthy lifestyles (Mandigo, 2010).

Physical activity is associated with positive health related outcomes (Frietas et al., 2014). Emotional and psychological well-being, better quality life and reduced risks of a variety of diseases associated with inactivity are among the significant outcomes related with physical activity and exercise. Physical education as a school subject focuses on teaching school-aged children the science and methods of physically active, exercise and healthy living (NASPE, 2012). This discipline is designed to engage learners in developmentally appropriate physical activities to develop their fitness, gross motor skills, and health (Robinson, 2011).

Research shows that PE and sport help learners reach their fitness goals and maintain a healthy weight which is also good for their mental stability which impacts positively on academic performance. Regular physical exercise is good for the mind, body and spirit. This calls for engagement of teachers in the delivery of PE and sport as a cardinal component of the learning process. Since it is also good for the teachers' health, there should be a deliberate move to have in-service P.E and sport clinics for those teachers in post-primary institutions who did not go through such trainings in

college to update their skills in the same. This in turn can supplement the scarce resources available in secondary schools and colleges in delivery of P.E and sport curriculum (Republic of Kenya, 2021).

The findings of the rapid assessment report on current status of teaching physical education and sports revealed that currently implementation of PE and sport in basic education institutions is hampered by various challenges. These include; low perception of PEs and sport by teachers and other stakeholders, inadequate resources including instructional material, equipment and teacher's capacity to effectively deliver P.E and sport. In addition, the delivery of P.E and sport curriculum in learning institutions is not adequately provided for learners with disabilities and special needs (The Kenya National Commission for UNESCO, 2019). Thus, there is a need to look at the initial teacher preparation and their pedagogical content knowledge towards the teaching of physical education.

The Kenya Education sector takes cognizance of national, regional and international commitments on Physical Education. These include the at national level the Constitution of Kenya (2010) and the Kenya Vision 2030; at regional level the East African Community Protocol and at international level the UNESCO International Charter of Physical Education and Sport (2015), Kazan Action Plan (2018), Sustainable Development Goals (SDGs) and Agenda 2063. These commitments have influenced the introduction of the Competency Based Curriculum (2017) in which Arts and Sports Science have been given prominence as a pathway, as well as the development of the Physical Education and Sports Policy (Republic of Kenya, 2020) for effective and efficient delivery of Physical Education and Sport programmes to all learners and communities.

According to the physical Education and Sports Policy, Physical Education and Sport help learners in character building. Participation in P.E and sport offers learners experience for socialization and integration. In addition, through P.E and sport, learners acquire self-discovery skills and develop a sense of achievement, actualization and freedom as envisioned in the Competency Based Curriculum (Republic of Kenya, 2020). PE and sport is both a learning area and career pathway. P.E and sport is an important enabler of sustainable development. In this view, there is a need to effectively prepare physical education teachers to be able to develop the right instructional capacity for teaching physical education.

The ongoing curriculum reforms for Basic Education in Kenya are premised on the Basic Education Curriculum Framework (KICD, 2017) and the Teacher Education Curriculum Framework (KICD, 2019), in a bid to facilitate the embodiment of the 21st Century learner and teacher respectively. These frameworks are hinged on the pragmatic philosophy of education advocating for growth through engagement in practical and experiential hands-on learning or learning by doing (Dewey, 1916; Showal, 2016). The mission of the BECF is "nurturing every learner's potential". Conversely, the mission of the Competency Based Teacher Education is to "develop a competent teacher committed to nurturing every learner's potential".

Pedagogical Content Knowledge (PCK) forms a knowledge base for the teacher, guiding their decisions and actions in the classroom. According to Shulman, Pedagogical Content Knowledge (PCK) "represents the blending of content and pedagogy into an understanding of how particular topics, problems or issues are organized, represented and adopted to the diverse interests and abilities of learners and presented for instruction" (1999, p.64). Teacher education programs are designed to accelerate student teacher's speed in acquiring the pedagogical knowledge and

skills needed for active teaching within a specified period of time. It is essential therefore that the student teacher has a good comprehension of the subject content knowledge in order to transform this information and present to learners in a simplified, flexible and adaptable manner.

The value of PCK has been emphasized since late 1980s, yet, still not much is known about the process of PCK. The TECF embeds the development of PCK for the varied subject the student teacher will be trained in including Physical Education. Further, amplified in the reformed three (3) year Diploma in Primary Teacher Education (DPTE) is Pedagogical Content Knowledge which is recognized as one of the competences the student teacher needs to acquire. The inclusion of structured micro-teaching covering 300 hours of the course and a longer practicum covering 600 hours of the course provides the opportunity to explore all the aspects of PCK. Additionally, this should enable the development of subject specific PCK (KICD, 2021).

The goal of Physical Education Teacher Education (PETE) Course is to train teacher trainees and develop them into highly competent and effective practitioners. In order to accomplish this task, certain identified topics are included in the PETE student's coursework. The PETE Course includes the following topical areas that have to be covered within the period of the course: a) skills and knowledge in sports; b) health- related fitness concepts; c) pedagogical knowledge including methods of teaching; d) student assessment strategies; e) opportunity for observation and reflection through micro teaching and f) teaching practice under the supervision of teacher trainers. The purpose of all these requirements is to ensure that the trainees acquire critical and relevant competences to enable them qualify to teach Physical Education to learners in Primary Education level (KIE, 2004).

This study on "The Influence of Student Teacher's Physical Education Pedagogical Content Knowledge on Achievement of Learning Outcomes in Primary Teacher Education" concentrated its focus on the Pre-service Physical Education Course with a view to assessing the level of acquisition of Pedagogical Content Knowledge and subsequent influence on the learning outcomes at primary level. This study fits in the research space of Physical Education Teacher Education in generation of knowledge on student teacher learning which is at the core of equipping them with appropriate knowledge, skills and values for quality delivery of Physical Education. The findings of this study lend credence to the key components of Pedagogical Content Knowledge in Physical Education with a view to proffering improvement in the training of student teachers.

1.3 Statement of the Problem

The 66th Session of the World Health Assembly made a commitment that the global target is to reduce prevalence of insufficient physical activity by 10% globally by 2025. One of the key elements that would enable the achievement of this target is improvement in the provision of Quality Physical Education (QPE) in educational settings with reference to learners from early years through to secondary education schools. The provision of Quality Physical Education is dependent on well trained teachers with relevant PCK, appropriate facilities, equipment and other resources.

Growing evidence demonstrates that among all educational sources, teachers' abilities are especially crucial contributors to students' learning (Darling-Hammond, 2006a). Thus, high quality pre-service training for teachers, to ground them in the Subject Content Knowledge for Physical Education, as well as the critical Pedagogical Content Knowledge that they need to teach effectively is essential (UNESCO, 2013). Physical and Health Education literacy can only be achieved as a result of provision

of structured Physical Education that provides a range of appropriate learning opportunities for different ages and stages of growth and development of the learners (Khatib and Fat'hi, 2012).

A strong knowledge of the subject matter taught is a prerequisite to be a competent and effective teacher (Shulman, 1986). Teachers who are well trained as physical educators exhibit higher levels of effective teacher behaviors (Constantinides et al., 2013) and create quality Physical Education programs. Nevertheless, scholars have argued that Physical Education in schools and as a teaching discipline is in the midst of a deep crisis and that the lack of appropriate preparation of teachers is a significant contributor to this crisis (Livingston, 1996).

Despite the fact that physical education is not examinable, there is growing evidence that learners in primary school demonstrate little enthusiasm in understanding physical education lessons. There is therefore need to interrogate the cause of the lackluster performance of physical activities related to health development of learners. One area that requires interrogation is whether the trainees in TTCs who represent freshness because of their nature, possess the requisite pedagogical skills, content and knowledge that would influence learners' positively towards PE.

By examining the contexts within which pre-service Physical Education Primary Teacher Education (PEPTE) is undertaken and involving pre-service teachers as co-researchers in validating the training curriculum, we better understand the gaps and challenges they experience in training to teach PE. With this understanding, curriculum developers and teacher trainers can plan interventions to ensure pre-service teachers acquire the pre-requisite competences in PCK to effectively teach PE. This study seeks to investigate the influence of student teacher's Physical Education

Pedagogical Content Knowledge on learner's achievement during Primary Teacher Education practicum, with a view to proffer suggestions for improvement in teacher training to enhance learners' acquisition of skills critical to their continued engagement in exercise as a lifelong and fundamental undertaking.

1.4 Purpose of the Study

The purpose of this study was to examine the influence of student teacher's Physical Education Pedagogical Content Knowledge on learner's achievement during Primary Teacher Education practicum, in the western region of Kenya.

1.5 Objectives of the Study

The objectives of the study were to

1. Determine the adequacy of the content covered in the Physical Education curriculum for teacher trainees;
2. Assess teacher trainees' views on the content of Physical Education curriculum for teacher training;
3. Evaluate the resources for teaching the Physical Education teacher in Teacher Training Colleges;
4. Assess the effectiveness of trainees' PCK for curriculum delivery in primary schools during teaching practice;
5. Examine the challenges encountered by trainees in teaching Physical Education to learners in primary schools during teaching practice.

1.6 Research Questions

The study sought to answer the following research questions

1. How adequate is the content covered in PPETE certificate course for preparation of student teachers?
2. What are the views of teacher trainees on the content of PE for teacher training?
3. What are the available resources for teaching PE in TTCs?
4. How effectively do teacher trainees demonstrate PCK when teaching PE during teaching practice?
5. What challenges do teacher trainees encounter when teaching PE during teaching practice?

1.7 Significance of the Study

Initial teacher training is the first step in assuring quality professional achievement of a teacher. Physical Education as a discipline is designed to instill life-long knowledge, skills and values in an individual as a result of participation in sports activities. They gain knowledge of maintaining physical health through exercise, they gain values and self-fulfillment through adherence to sportsmanship and acquire opportunity for career paths by exploiting their talents in performance of various games and sports. For all these to be achieved, there is need for a high quality teaching force to nurture each learner to reach their full potential. This is the mission of the Competency Based Curriculum introduced in Kenyan for Basic Education and Teacher Education (MoE, 2021).

The role of evidence in designing Teacher Education programs is critical in ensuring there is a process of continuous improvement in achieving benchmarks as well as intended outcomes. This study focuses on the influence of student teachers PCK on

the outcomes of learners. The establishment of PCK in Physical Education will greatly influence the development of Teacher Education Physical Education curriculum, relevant policies and frameworks. The general findings can be used to establish the PCK in all other subjects offered in Teacher Education.

Thus, Ministry of Education can include this as a requirement in the yet to be developed Teacher Education policy Physical Education. This study would also provide information to draw from and improve the PETE curriculum especially with the ongoing curriculum reforms, focusing not only on CK but blending with PC for robust application of teaching methodology (PCK). This will be beneficial across both Teacher Training Colleges and Universities where Physical Education is taught.

1.8 Justification of the Study

Teacher education systems benefit continuously from building new evidence as a strategy in improving initial teacher education programs. The introduction of the Competency Based Curriculum has elevated Physical Education from a subject that was not nationally examined to a clear academic pathway at Senior School Level Grade 10-12. Students have the opportunity to take the Arts and Sports pathway in which Sports Science is a distinct track that allows them to begin their career quest in sports at Basic Education level (BECF, 2017). Equipping teachers with the relevant knowledge, skills and values is the basis for assuring the appropriate execution of programmes and activities to enable learners achieve the benefits of Physical Education.

The Teacher Education curriculum in Kenya has been reformed to be Competency Based in which one of the shifts is from teaching content and pedagogy separately to teaching them concurrently. PCK is a new concept introduced in the Competency

Based Teacher Education, whose parameters will need to be defined for each subject. The study sought to ascertain the influence of PCK components as defined by Bandura, and how they were enacted in the teaching of Physical Education. This is the first study in Kenya that attempts to define the components of PCK in PE, to ensure the student trainees are adequately prepared to take on their teaching role. The findings of this study will inform implementation of the Competency Based Diploma Primary Teacher Education currently being implemented on key aspects of Pedagogical Content Knowledge in Physical Education.

1.9 Scope and Limitations of the Study

This section discusses the scope and limitation of the study

1.9.1 Scope of the Study

The study was carried out in Primary Teacher Training Colleges in the Western region of the country. The targeted colleges included both public and private teacher training institutions. The study was conducted amongst second year student teachers who had covered most of the topics in the Physical Education. It was carried out during the period of teaching practice. Whereas there are a wide range of variables that would constitute CK and PCK, the study variables that were measured were the student teacher's Subject Content Knowledge (SCK), knowledge of instructional strategies and representations, classroom organization and management and knowledge of learner's abilities and preferences.

1.9.2 Limitations of the Study

The study adopted descriptive design in order to describe the curriculum theory and practice, knowledge and skills acquired by the student teachers in Physical Education and relate to the competence of learners in the primary schools. This could aptly have

been done by a longitudinal study but the option was not adopted by the researcher due to time and budgetary constraints. Additionally, the researcher had no control on the characteristics of the primary school pupils who were observed for determination of the performance. The data was collected using various research instruments namely: questionnaires for pre-service teachers, interview guides for lecturers of physical education, observation guides for pre-service teachers during practicum and a resources checklist.

1.10 Assumptions of the Study

Assumptions are things that are accepted as true or plausible by researchers and peers reading works of research. One of the assumptions of the current study was that the participants would answer the questions honestly and factually, since it would take a lot of time to validate answers of each participant, I assumed the response would be honest.

1.11 Significance of the Study

The current study should be able to contribute significantly to knowledge in the area of physical education. Reflecting on pedagogical content knowledge should enable teacher trainees and their trainers rethink the learning objectives content taught, instructional methods applied, teaching resources as well as learner characteristics which nurture professional competencies. Furthermore, the study could influence credentialing requirements of physical education teachers as it relates to efficacy of teachers.

Due to the geographical selection of the study area and the number of participants involved in the study, it might not be possible to generalize the findings of the study to the whole nature.

1.12 Theoretical Framework

This study was based on Bandura's Social Cognitive Theory (Bandura, 1986). The key constructs of the Social Cognitive Theory are observational learning, reinforcement, self-control and self-efficacy. Learning occurs in a social context with a dynamic and reciprocal interaction of the person, environment and behavior. The Social Cognitive theory emphasizes the major role cognition plays in encoding and performing behaviors. These are influenced by activities, educational circumstances, socio-cultural constraints and opportunities. Environments that influence behavior include imposed, selected and constructed environments for which persons have no control of (Bandura, 1999).

According to the Social Cognitive Theory, individuals have the power to influence their own actions by being organized, proactive, reflective and self-regulating in order to produce definitive results. PCK as defined in this study relates to the environmental conditions influencing the student teacher's performance (the teacher's classroom organization and instructions including demonstration), the student teacher's adaptation to the tasks by offering guidance for the learner's better understanding and incentive to perform and the student's ability to perform specific tasks. This study takes cognizance of the experiences student teachers are exposed to in order to consciously demonstrate their acquisition of effective teaching skills.

It could also be of value to policy makers to have an empirical measure of options regarding physical education training content as a base of preparing teachers to address challenges faced by learners during physical education classes.

The study also provides specific insights into the areas of general pedagogical knowledge and pedagogical content knowledge available to teacher candidates.

Pedagogical Content Knowledge is a unique knowledge domain for teachers and refers to teachers' knowledge of how to organize and represent particular topics or issues to facilitate students' understanding and learning (Shulman, 1986). Therefore, student teachers are expected to know how Physical Education concepts are developed and the connections between them, teaching goals for different class levels, the needs of their students, selection of appropriate activities and use of appropriate teaching strategies. Thus modelling may serve in any of three ways:- a) as a cue to imitate similar behavior in others; b) to strengthen or weaken the learner's existing restraint against performing a modelled behavior; and c) to demonstrate new patterns of behavior.

During a Physical Education lesson, the teacher demonstrates a skill, the learners reflect on what the teacher has demonstrated. This is an example of environment (teacher's demonstration) influencing cognition (personal factor). Some pupils may be able to perform from observing the demonstration, while those who have not conceptualize may ask for a review of the demonstration by the teacher before they attempt to demonstrate. Attempting the demonstration shows the influence of personal factors (cognition) on behavior (skills demonstration). The teachers' review of the demonstration is an example of behavior influencing environment.

Behavior cognition and personal factors as well as environmental influences all operate as interacting determinants that influence each other to result in behavior. The ultimate result is the learner's performance.

Social Cognitive Theory (Bandura, 1986) of human behavior is founded on the model of causation, involving triadic reciprocal determinism, observational Learning and Self-efficacy. In this model, Bandura argued that behavior was not just about internal

forces or motivated by internal desire. The three key concepts of Social Cognitive Theory are Observational Learning, Triadic Reciprocal Determinism and Self-efficacy (Bandura, 1986). Observational Learning suggests that we can learn either from direct experience or from observation of others. The key process underlying this concept are **attention** (*have an interest in the behavior being modelled*), **retention** (*remember what has been demonstrated*), **motor reproduction** (*copying, imitating, learning, doing it physically*) and **reinforcement and motivation** (*be encouraged and motivated to do it*). Self-efficacy is your belief in your ability to do something. It signifies confidence which is an important factor for achievement. The Triadic Reciprocal determinism is the relationship between external factors (causation), internal factors (biology and thinking) and our behavior (e.g. aggression) as they influence one another.

These concepts are a reflection of the interactive nature of PCK in PE expressed in the diagram below:

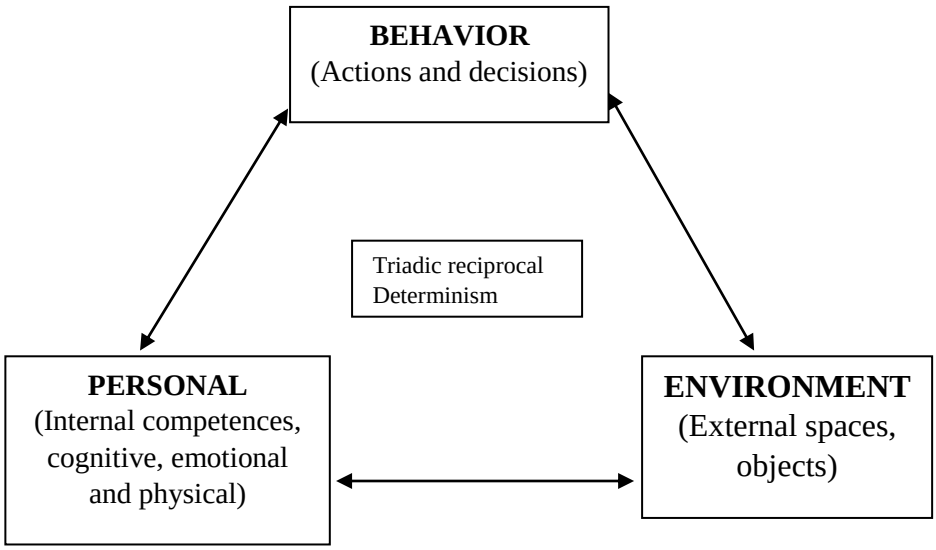

Figure 1.1: Illustration of Triadic Reciprocal Determinism

Social Cognitive Theory accords a central role to the cognitive, self-regulatory and self-reflective process in human adaptation and change. The human function is

therefore viewed as a product of a dynamic interplay of personal, behavioural and environmental influences. Emphasis is laid on the critical role of cognition in people's capability to construct reality, self-regulate, encode information and perform behaviours. Cognitive representations of experiences in knowledge structures provide the substance for thinking while rules and strategies provide the cognitive operations for manipulating knowledge for different purposes. For Bandura (1986), ***self-reflection***, is a prominent feature of social cognitive theory. Through self-reflection, people make sense of their experiences, explore their own cognitions and self- beliefs, engage in self-evaluation and alter their thinking and behavior accordingly. By symbolically manipulating the information derived from personal and vicarious experiences, learners gain understanding of causal relationships and expand their knowledge. In Social Cognitive Theory, people function as contributors to their own motivation, behavior, and development within a network of reciprocally interacting influences. The components emphasized in the Social Cognitive Theory are critical to the process of teacher training. The student teacher is taken through various aspects of subject matter content (CK) and general pedagogical content, is exposed to various experiences including micro-teaching and teaching practice. The pre-service teacher is expected to integrate the CK, general pedagogy and knowledge of learner's characteristics to be able to select and articulate the relevant teaching methods and approaches (PCK) to influence the learners' acquisition of the concepts taught.

1.13 Conceptual Framework

PCK is consistent with and similar to Shulman's idea of knowledge of pedagogy that is applicable to the teaching of specific content. Central to Shulman's conceptualization of PCK is the notion of the transformation of the subject matter for teaching. Specifically, according to Shulman (1986), this transformation occurs as the

teacher interprets the subject matter, finds multiple ways to represent it, and adapts and tailors the instruction and materials to students' prior knowledge. PCK covers the core business of teaching, learning, curriculum, assessment and reporting, as conditions that promote learning and the links among curriculum, assessment, and pedagogy. An awareness of common misconceptions and ways of looking at them, the importance of forging connections among different content-based ideas, students' prior knowledge, alternative teaching strategies, and the flexibility that comes from exploring alternative ways of looking at the same idea or problem are all essential for effective and reflective teaching.

The variables that will be measured in this study are the teacher trainees Subject Content Knowledge (SCK), knowledge of instructional strategies and representations, classroom organization and management, knowledge of learner's abilities and interests. Physical education for teacher training can only be taught successfully if there are certain basic components available. The curriculum provides the framework for the scope and sequence of the topics to be taught. These include foundational coursework relating to history, psychology and sociology of physical education, as well as the skills in a variety of sports and games as the basis for teaching learners how they are executed. Facilities and equipment which range from playing grounds, courts and gymnasia to the sporting implements for the various sports and games play a critical role in the teaching and learning process.

The teachers' physical and professional ability to participate in the range of practical activities is critical as the basis for transmitting the same to the learners through demonstration. These inputs into the process are the foundation. They then facilitate the teaching process in which the pre-service teacher expounds on the leant SCK and

pedagogy to select the activities that the learners will undertake and the teaching method to be used to facilitate the learning (PCK). The result is the learner's ability to execute the skills taught and later be able to transfer them into a game situation, thus reflecting the teacher's effectiveness in teaching. Figure 1.2 illustrates the conceptual framework of the study.

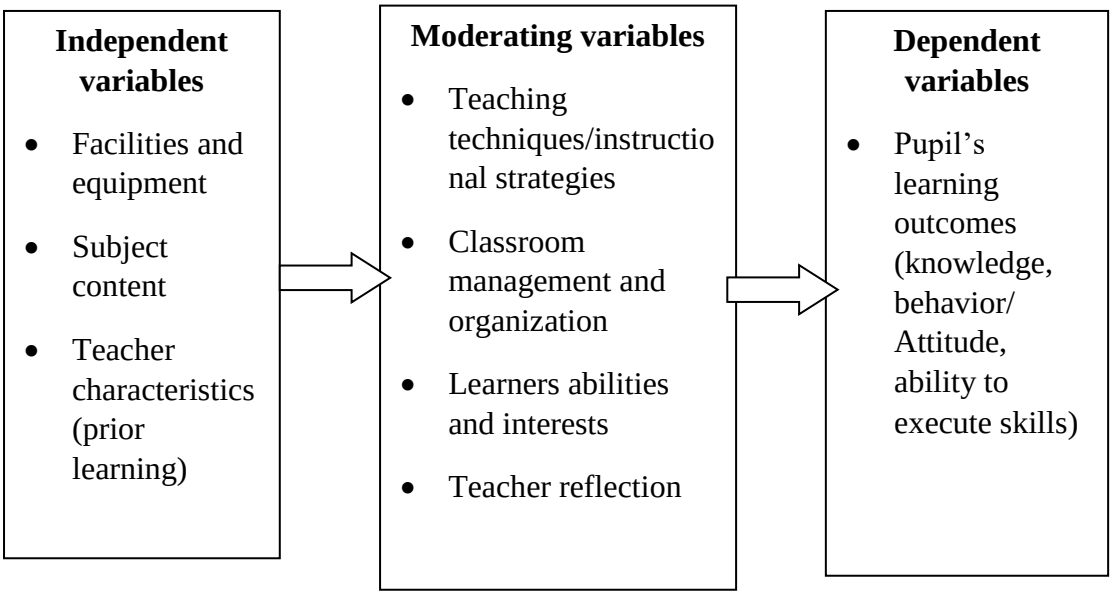

Figure 1.2: Graphic representation of the Conceptual Framework

1.14 Operational Definition of Terms

Competence: Ability of the student teacher to apply relevant knowledge, skills and attitudes during the practicum

Curriculum: The physical education course content covered in the Primary Physical Education Teacher Education Course

Instruction: The process of setting conditions of learning by the student teacher to direct or order selected learning activities that lead to learning. In the context of the study instruction was in reference to PE.

Knowledge: The body of concepts and factual information concerning the physical education functions and procedures surrounding the complex task of teaching and learning

Movement skills: Body movements activities which are categorized as locomotor, non-locomotor and manipulative and which relate to physical education.

Pedagogy: The art and science of teaching physical education as a field of study.

Physical activity: Bodily movement produced by the contraction of the skeletal muscles that increases energy expenditure above the baseline level.

Physical Education: A curriculum area which teacher trainees are subjected to in the course of their presentation.

Professional values and behavior: The student teacher's mode of conduct, ethics and high standards of commitment towards their teaching role

Student teacher: An individual enrolled in a teacher training college for the purpose of acquiring pre-requisite competences in the teaching profession.

Teacher Competences: A description of the skills, knowledge, attitudes and behavior the student teacher requires teaching Physical Education effectively.

Teacher Preparation: Practices the student teacher undergoes to facilitate acquisition of pedagogical skills to enable them teach Physical Education in the school system

Teaching Skills: Instructional processes, strategies and classroom management techniques that the teacher uses to facilitate and enhance learning in Physical Education

Teacher trainer: A qualified person in teacher education who is experienced and who guides prospective teachers on knowledge and skills required for effective teaching of Physical Education.

1.15 Summary of Chapter One

Physical Educations contribution to the personal, social and physical development of the child has been well documented in many research studies. Physical Education (PE) provides children with the knowledge, skills and understanding necessary to perform a variety of physical activities, maintain physical fitness and to value as well as enjoy physical activity as an ongoing part of a healthy lifestyle. The art of teaching implies the transmission and translation of knowledge from one to another. Therefore, the student teachers' ability to demonstrate and guide learners through a range of practical activities is critical.

Shulman's concept of PCK has been particularly useful in understanding how teachers translate their understanding of subject matter into classroom practice. PCK thus embodies the working knowledge teachers use to plan, organize and guide their teaching. Student teachers translate the learnt curriculum and pedagogical knowledge addressed in coursework into enacted curriculum while on teaching practice to facilitate their learners' acquisition of skills taught. This study sought to establish the influence of pre-service teachers' PE PCK on the achievement of learning outcomes during practicum.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Literature in this study was reviewed under different subheadings. These majorly reflected the theme of the objectives. The discussions are therefore organized thematically covering major areas of the study which include the concept of pedagogical content knowledge, physical education and teaching resources for physical education.

2.2 Interpretation of the Concepts of the Study

2.2.1 Content Knowledge

Content-Related Knowledge contains domain-specific subject-matter knowledge, also known as Content Knowledge (CK). It refers to the facts, concepts, theories and principles that are taught and learned in specific subject matter. Shulman's seven major categories of teacher knowledge were meant to highlight the important role of content knowledge and to situate content-based knowledge in the larger landscape of professional knowledge for teaching.

At the same time, however, Shulman (1986) clarified that the general categories were crucial and emphasis placed on content dimensions of teacher knowledge was not intended to denigrate the importance of pedagogical understanding and skill: "Mere content knowledge is likely to be as useless pedagogically as content free skill".

2.2.2 Pedagogical Knowledge

Shulman (1986) defines it as a teacher's understanding of how to help students understand specific subject matter topics and knowledge of how problems and issues can be organized, represented and adapted to the diverse interests and abilities of

learners and then presented for instruction. According to Organization for Economic Co-operation and Development (OECD, 2017), Pedagogical knowledge is the specialized knowledge of teachers in creating and facilitating effective teaching and learning environments for all students, independent of subject matter. The first key study on teacher knowledge (Shulman, 1987) categorised teacher knowledge into seven categories, among which were the concepts of: general pedagogical knowledge (principles and strategies of classroom management and organization that are cross-curricular) and pedagogical content knowledge (the knowledge which integrates the content knowledge of a specific subject and the pedagogical knowledge for teaching that particular subject). This latter was considered as the most fundamental element of teachers' knowledge and has been studied widely since. In contrast, general pedagogical knowledge has not been the object of many research studies even though several studies indicate that it is essential for developing quality teachers.

2.2.3 Pedagogical Content Knowledge

Knowledge of both content and pedagogy is a prerequisite for teachers in how they select, design, and sequences classroom tasks. This demonstrates the teacher's ability to produce worthwhile learning experiences because pedagogy and content are inextricably connected. Different perspectives about what constitutes teachers' knowledge domains have led to different definitions for PCK and various descriptions about its nature. When Shulman first introduced the term in 1986, he defined it as knowing how to represent the subject matter to facilitate students' understanding. However, as a result of arguments about teacher knowledge domains, PCK is either accepted as a distinct knowledge domain for teaching or not. Not only is identifying PCK as a knowledge domain controversial, but constituents of that knowledge are also debated by scholars.

2.3 Teachers' Knowledge Base

There have been considerable amounts of literature on what knowledge student teachers need to develop in order that they would become effective teachers. The same is applicable to the development of trainees' knowledge of physical education.

There are numerous ways of conceptualization knowledge for teaching. Hoyle and John (1995) highlighted knowledge underpinned by Rousseau and Dewey as replaced by generic knowledge from social sciences. Within the classroom set up, the action research approach specific knowledge develops from systematic reflection on one's classroom experiences. According to Hopkins (2002) such reflections on classroom experiences lead to understanding and creation of meaning out of such understanding. The capacity to reflect on an action inorder to engage in a process of continuous learning is one of the defining characteristics of professional practice. Elbaz (1983) categorized teachers' practical knowledge into several categories. These include knowledge of self, knowledge of the milieu of teaching, knowledge of the subject matter, knowledge of the curriculum, and knowledge of instruction. Leinhardt and Smith (1985) conceptualized teachers' knowledge base as being made up of knowledge of lesson structure. Those were extremely limiting since teaching requires more than merely mechanics of the subject and how it is delivered.

Shulman (1987) identified seven knowledge bases which formed what he regarded as minimum knowledge base for teaching. The first knowledge base, content knowledge, dealt with the subject matter, content knowledge include knowing the important concepts and skills in a subject. Similarly, the knowledge relates to the syntactic structures of knowledge which implies knowing how the concepts and skills are structured and organized within the subject.

Secondly, Shulman identified general pedagogical knowledge as a critical knowledge base. This knowledge base relates to the broad principles and strategies of classroom management and organisation that apply to teaching regardless of the subject. Similarly, the third category of the knowledge base of teachers as proposed is curriculum knowledge. This form of knowledge relates to materials and programmes that serve as tools of trade for teachers.

Fourthly is pedagogical content knowledge. This knowledge is the basis that is the selection organisation and presentation of content which teachers wish their learners acquired. It is the integration of content and pedagogy for teaching purpose that makes the content instructional.

In discussing pedagogical content knowledge, Grossman (1990) identified four components of pedagogical content knowledge. These are knowledge and beliefs about the purposes of teaching a subject at different grade levels, knowledge of pupils' understanding, conceptions and misconceptions of subject matter, knowledge of curriculum materials available for teaching a subject and knowledge of horizontal and vertical curricular of the subject. The final component is knowledge of instructional strategies and representations for teaching particular topics.

Knowledge of learners and their characteristics is equally identified as a critical base for teachers. This relates to knowledge of child development and knowledge of particular group of learners. Similarly important is knowledge of educational contexts including specific schools, their catchment area and the wider community.

Finally, teachers need to possess knowledge of educational ends, purposes, values, philosophical and historical influences. Shulman's framework is often used in research about knowledge for teaching in general and in physical education

specifically as with the current study; which focuses on pedagogical content knowledge.

Currently in Kenya, initial teacher education is founded on competency conceptualization of knowledge. Trainee teachers have to demonstrate what they know, understand and are able to do in order to merit being teachers. The generic standards inherent within the three broad standards are applicable to teachers learning to teach at different age levels of physical education and which is part of what the current study sought to determine.

2.4 Overview of Teacher Education

Many researchers stress that teacher education programs need to help pre-service teachers improve their knowledge of and skills for effective teaching through coursework and practice (Borko & Putnam, 1996; Philipp et al., 2007). The findings of studies on pre-service teachers support the recommendation that content knowledge, pedagogical content knowledge, and pedagogical reasoning should be central foci of teacher education programs (Brown & Borko, 1992; Grouws & Schultz, 1996). Studies also show the impact of coursework and field experiences on pre-service teachers' knowledge of and beliefs about teaching mathematics and provide suggestions for further studies in this area.

Pre-service primary teacher training systems vary in terms of entry requirements, duration, and the balance of campus-based and school-based components. Nevertheless, some common trends have emerged. Effective teacher preparation involves balancing the duration of the training with the available capacity and requirements, balancing the teaching of subject matter with the development of

practical skills, and balancing the desire to teach to the highest international standards with the real level of education of the entrants to teacher training (Mulkeen, 2010).

Teacher training and professional development are provided by a wide range of institutions, their programs are more complex, and their quality more divergent. Prospective teachers have a broader array of potential professions from which to choose and researchers are exploring more varied problems. In the Foreword to the third edition of the Handbook of Research on Teacher Education (Cochran-Smith, Feiman-Nemser, McIntyre & Demers, 2008), Houston (2008) acknowledges that although many aspects of teacher education have changed and improved over time, many of the major challenges are yet to be overcome.

2.4.1 Importance of Physical Education Teacher Education

The subject areas of Health and Physical Education (HPE) face a similar predicament. While research and practice has improved how HPE has been thought about, researched, and taught, there remain many barriers that have existed for generations that inhibit it being taught well in all schools (Kirk, 2010; Mandigo, 2010; McKenzie & Lounsbery, 2009). It may therefore be apt to claim that the situation for teacher education and HPE traces a parallel trajectory in that both have been overwhelmingly recognized as beneficial for the populations they serve (beginning teachers and school-aged children, respectively) and go a long way toward meeting their respective purposes.

However, for more than a century they have faced continual criticism and have had to argue for their place in the institutions in which they are located. Both have been recognized as part of the problem and a potential solution to improving aspects of education but that tension continues to exist today (O'Sullivan, 2006; Siedentop &

Locke, 1997). This section discusses several challenges faced by both teacher education and HPE, and the promising practices that are emerging to address these challenges.

The current PTE curriculum comprises of primary school subjects (which include physical education), teaching methods, professional studies and teaching practice. In the first year, the trainees are required to take 10 subjects that are compulsory and have one session of Teaching Practice (TP). In the second year trainees specialize in either sciences or humanities taking nine subjects and have two sessions of Teaching Practice (TP). Physical Education is a core subject and is therefore undertaken by all the pre-service teachers in both first and second year (KIE, 2004). Being a compulsory subject at both PTE, primary education it is critical that trainees get the right skills to enable them guide young learners to acquire the relevant skills to participate in sporting activities as well as keep healthy through exercise. Over the years, the performance of teacher trainees in Physical Education has not been very good and this has implications on both their teaching practice as they are sent to various schools.

2.4.2 Importance of Physical Education

Physical education (PE) was declared a compulsory subject in Kenya's educational curriculum by a Presidential Decree in 1989 by the then President Daniel Toroitich arap Moi. Sports on the other hand are articulated as co-curricular activities within the schools programmes. The acceptance and inclusion of PE and sport in the school curriculum is in line with the United Nations Charter for Physical Education and Sport, which was proclaimed by the UNESCO Conference on 21st November 1978 in Paris, France. The conference stated that PE and sport has a major role to-play in the

all-round development of an individual. The UNESCO Charter of Physical Education and Sport (1978) affirms that:

> "Every human being has a fundamental right of access to physical education and sport, which are essential for the full development of his personality. The freedom to develop physical, intellectual and moral powers through physical education and sport must be guaranteed both within the educational system and in other aspects of social life (p.22)."

Physical activity, which is the core of PE, positively impacts the growth and development of children. According to Pangrazi (1998) and Wetton (1988), research supports the value of an active lifestyle for optimum growth and development. The World Bank (1989) confirms that the child's fastest growth in physical, mental and socio-emotional characteristics takes place during the age of 0-5 years. UNICEF/UNEP (1990) further points out that, the child is most vulnerable to environmental influences during this period and growth deficiencies occurring during this period are difficult and sometimes impossible to reverse.

Robinson et al., (1998) highlight the various benefits of PE to the growth and development of children. Physically, it strengthens muscles, helps to develop the lungs by deep breathing, and improves coordination, body awareness and balance. It enhances good posture, helps to prevent the buildup of body fat, promotes sleep, and improves appetite and digestion of food. It also improves circulation by strengthening the heart muscles, develops manipulative skills, spatial awareness and eye-hand coordination. Socially, emotionally and cognitively, it encourages achievements and a sense of purpose which raises self-concept, encourages self-expression and self-control. It encourages cooperative behaviour such as sharing and taking turns, gives an opportunity for adventure and for learning how to cope with fears and anxieties. When at play, children have been found to persevere longer in seeking solutions to problems in the tasks they engaged in (Bruce, 1991). There is also a relationship

between motor experience, creativity and cognitive development as PE helps to develop conceptualization. It stimulates mental development as children play with others, with objects around them and as they explore more of the world around them (Drewe, 2001; Galloway, 2007; Macfadyen & Bailey, 2002).

Physical education and sport are an important learning area which aims at a holistic development of a learner. In basic education, P.E provides an avenue for learners to be active and learn necessary skills, knowledge and attitudes that lead to a lifelong active lifestyle. Through P.E and sport activities and programmes the mental, social and physical well-being of individuals is improved while creating a healthy and active society (Republic of Kenya, 2021).

2.5 Policies reflecting requirement for improvement in PE

McKenzie *et al.* (1997) referenced the requirement for improvement in PE as a goal for both professional organisations and public health organisations, but despite its recognition in the literature and reflections within policies, there have only been short-term improvements to PE. In the 1980s, the media and political engagement sparked an unusual political interest in PE, contributing towards a public debate around competitive sport and the content of the National Curriculum in relation to young people (Houlihan and Green, 2006). Policies in relation to PE received increased attention, particularly due to their impact in improving PA levels, physical fitness and obesity prevention (Sanchez-Vaznaugh *et al.*, 2012). Although policies seek to achieve change through influencing PE, their success is primarily dependent on mechanisms in place to ensure compliance by schools (Sanchez-Vaznaugh *et al.*, 2012). The decision to include PE as one of the foundation subjects within the school curriculum was greeted with relief according to Houlihan and Green (2006); due to the substantial sums of Treasury and Lottery money allocated to school sport and PE

projects in addition to the monitoring by the Prime Minister's Delivery Unit that all schools deliver two hours of high quality PE per week. However, the policies sort to overcome rising health concerns through increasing and unifying the quality of PE children experience within schools to achieve the proposed objectives towards PA and obesity prevention rather than encompassing and developing the holistic approach demonstrated within the literature.

The Physical Education, School Sport and Club Link Strategy (PESSCLS) funding provided an essential investment into PE and youth sport but Kirk (2005) demonstrated the funding would only have limited impact on the long-term outcomes desired rather than inspiring lifelong participation in PA. Kirk (2004) additionally argues that the PESSCLS strategy was unable to address the recognised issues within PE due the absence of a research base and agenda grounding the strategy; demonstrating the requirement for a greater understanding of PE in order to effectively utilise funding. Despite the introduction of policies and initiatives, it is evident that the same concern towards the National Curriculum of PE is highlighted as a focal issue (Griggs, 2007) despite McKenzie *et al.* (1997) stating the requirement for improvement 10 years before. This demonstrates the difficulties PE has faced in improvements despite PESSCLS, including a variety of initiatives aimed at raising the levels of participation in school sports, with the differing nations within the United Kingdom using the funding across a variety of different methods to promote the subject within their own contexts (Bailey et al., 2009).

For children in the UK to achieve continued PA in later life, the Association for Physical Education's (2008) statement paper explicitly advocates children's participation in appropriate amounts of PA during PE classes. The UK Chief Medical

Officer's Guidelines (2011) provided further guidance towards leading a healthy, active lifestyle, recommending a minimum of 60 minutes of moderate to vigorous PA per day. Under new policies, schools are required to provide a minimum of 30 minutes of PA per day, separate from PE but allowing PE to contribute towards the daily total. Strong *et al.* (2005) provides further collaborative evidence to the new policy implemented, concluding children 'should participate daily in 60 minutes or more of moderate to vigorous PA that is developmentally appropriate, enjoyable, and involves a variety of activities'. These discrete periods of the day for direct and indirect promotion of PA are key to improving PA among children, in addition to travel to and from school with PE as the facilitator for continued participation in PA (Mersh and Fairclough, 2010). Although it is suggested the required daily PA can be achieved through break times and PE classes in addition to before and after-school programs (Strong *et al.*, 2005; Pate *et al*., 2006), the requirement for increased PA cannot replace PE due to its differing purpose. Despite the promotion and participation element, PA does not educate towards lifelong participation on the journey of PL to the same degree or purpose as PE but instead, encompasses all activities including energy expenditure, with educational aspects a secondary benefit rather than the primary purpose of PA.

2.6 Delivery of Physical Education currently

As professionals, teachers, by definition, hold a specialised body of knowledge in their subject area (Furlong *et al.,* 2000), although this is a somewhat dated definition not considering the transferal of knowledge or defining the level of specialisation across each subject prior to starting teaching. Postgraduate Certificate in Education (PGCE) students often only receive six to eight hours of PE provision during their training or as referenced by Faulkner *et al*. (2004), there is a tendency for

primary teachers to have a specialisation in an alternative subject altogether than PE. This has led some teachers to believe they are insufficiently qualified to teach PE, with the perceived inability in teaching PE resulting in a lack of confidence in the subject (Morgan and Hansen, 2008). The lack of PE training for teachers is supported by Carney and Guthrie (1999) who documented 10 to 20 hours of the Scottish PGCE courses focused on PE in addition to stating training was deemed inadequate by training PE trainees.

Research exploring the training of primary teachers is limited, perhaps because of an increasing normality for external PE service providers to be used or the lack of unified training for teachers. 142 universities in the United Kingdom offer an undergraduate degree containing Sport in the title for 2017 as demonstrated by a UCAS search for 'Sport' courses.

Of these universities, multiple course options are available, differing from university to university. The qualifications required for entry onto PGCE courses are standardised, requiring a C at GCSE in Maths, English and Science for primary level and an Undergraduate degree for entry onto a PGCE (Department for Education, n.d.). However, no previous teaching experience unless stated by the University is required, potentially leading to much of the teacher's experience of teaching gained within their one-year PGCE course. The requirements listed (Department for Education, n.d.) also demonstrated that unless specialised within the Undergraduate Degree, prior to PGCE, the individual may only understand the subject area to GCSE standard. This raises concerns for the ability for PE to achieve its objectives if the classroom teacher has limited knowledge or experience of the subject, particularly through the lack of uniformed standard through the many

different routes a teacher can take to achieve the same status.

Thornton *et., al* (2002) considered the reasons students choose to train as teachers with enjoying working with children and a high job satisfaction as major reasons for the decision to continued teaching. However, reservations were also noted in the teachers perceived ability of themselves in achieving the required standard within teaching which subsequently resulted in the reduced confidence of teachers (Thornton *et al.,* 2002). Further to this, Morgan and Hansen (2007) concluded that inadequate training, insufficient equipment and facilities, low levels of expertise and confidence, and time constraints were difficulties perceived by teachers when approaching PE. Primary school teachers have experienced many issues with implementing PE strategies previously provided to assist in delivery, with many deemed insufficient or inadequate in helping with the delivery of quality PE (Morgan and Bourke, 2005). Allender *et al.* (2006) concluded that young children were more likely to participate if the activity is more enjoyable, ranging in activities and they are not being forced to be competitive and win. Progressing into adulthood, negative experiences of school PE lessons in addition to anxiety and lack of confidence were recognised as influential reasons for not continuing with PA (Allender *et al.,* 2006). Negative student experiences in PE lessons was first highlighted as a reason for not participating in PA by children in early secondary school (Allender *et al.,* 2006), demonstrating the importance of a positive experience in primary PE for children for continued participation in PA.

Although it is acknowledged that regular PA habits lead to healthy lifestyle, there has been limited research into the pedagogical approaches best placed to ensure the health benefits are achieved later in life (Singleton, 2009). Motivation is an additional key

factor to participation, with Chen (2001) viewing motivation as a major influence on the learning outcomes of students. Previously described aspects within the literature as the outcome objectives of PE can be recognised through Whitehead's (2013a; p26) description of PL as the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities in life, further strengthening the argument that educated children through the PL journey should be accepted as the primary purpose of PE. However, despite this understanding of PL, Moy *et al.* (2015b) particularly recognise how traditional methods fail children in PE on a physiological level through the lack of cognitive development in the repetitive games. The suggestion that the PE curriculum fails to teach the necessary social and psychological skills and abilities (Penney and Chandler, 2000) has led to a growth of research into non-traditional methods of learning in PE (Richard, 2008). Aelterman *et al.* (2013) evidence the well-documented gap between Education material available and its practical application. The theoretical models available to teachers have a lack of practical value in their comparable use in a classroom situation with the differing challenges presented (Aelterman *et al.*, 2013).

2.7 Progression in Theoretical Conceptualisations

Tan *et al.* (2012) noted a recognised move for teaching and learning in PE in academic literature, progressing from a traditional view where the teacher was placed at the centre of the learning experience to a student-centred approach, encouraging the discovery of knowledge and relevant skills in relation to the construction of knowledge. Traditional methods have previously prevailed above non-traditional methods due to the factual biological evidence of repetitive learning provided in presenting traditional method approaches, despite leading to lack of criticism towards the segregation within classes and the activities marginalising females (Singleton,

2009). Traditional methods, developed from studies exploring the student-teacher relationship, centred almost entirely on how specific behaviours from the teachers would lead to the students acquiring specific-matter knowledge; creating a distinctly behaviourist concept with the teacher at the centre (Fenstermacher, 2001). This assumption of learning as a measurable process previously embedded into Western culture (Light, 2008), led to skills perfected in a drill environment before they were practiced in a game situation (Light, 2004) and continues to be a regular recognised practice in PE.

Traditional methods follow a computerised-approach exampled by behaviourism, a paradigm where teachers shape students' behaviour (Kirk and Macdonald, 1998) with a notably sudden paradigm shift to cognitive sciences through non-traditional methods (Bargh and Ferguson, 2000). Despite the shift, traditional methods continue to be analysed against constructivist theories by scholars such as Weegar and Pacis (2012) and Singleton (2009), who stated the dismissal of the behaviourist approach as a viable theory due to it not considering the mind of the learner as part of the learning process. Singleton (2009) drew from numerous sources (Kelly *et al.,* 2000; Macdonald *et al.,* 2002; Richardson, 2003) to determine that despite the significant volume of support around teaching the PE curricula, for the majority, non- traditional, student-centred approaches were not chosen within the PE environment. For PE, in contrary to academic research, behaviourism continues to dominate with structured practices segmenting knowledge towards acquisition of motor skills in their simplest form (Mastrogiannis *et al.,* 2014). However, the traditional approach with a decomposition of practice into sections such as warm, drills and cool down limits the learning opportunities available to the children in addition to only engaging children in practice for roughly a quarter of the time the PE class runs (Chow *et al.,* 2009). The

separation of parts in practice of traditional approaches limits learning because only activities that are performed in an environment representative of the performance environment will lead to a transfer and understanding of skills in the creation of knowledge (Chow *et al.,* 2009). However, PE has been affected, although without immersion of the change of paradigm, with research exploring non-traditional methods such as constructivist theories within the field of PE, due to the advocated holistic approach to learning through conscious, cognitive engagement of the student within non-traditional approaches (Mastrogiannis *et al.*, 2014).

Moy *et al*. (2015a) further supports the progression from traditional teaching methods that have a too great focus on repetition of technical skills reproduced from demonstration of the teacher to a more contextualised approach of repetition. The central theme emerging towards improving practice has an aim of creating developing intelligence in thinking individuals to allow the critical re-creation of interpretive play through allowing individuals to make their own decisions (Moy *et al*., 2015b). However, the transfer to non-traditional methods has been an on-going process towards acceptance in practice, despite noted by Azzarito and Ennis (2003) as widely accepted in the field of education academically. Over the last twenty years the positive benefits have been acknowledged by various scholars, in example, Azzarito and Ennis (2003) and Cothran and Ennis (1999); who understood the social interactions and community involvement of constructivist approaches to be pedagogical goals used to enhance learning. Through a greater understanding of the non-traditional methods, nonlinear and constructivist methods, Teaching Games for Understanding and Game Sense were designed to provide a more efficient learning environment for students. The cognitive and physical engagement enabled within games such as Teaching Games for Understanding, developed from nonlinear

approaches, has associated positive benefits such as the achievement reward through tactical decision making in addition to the social and emotional developments through the team environment created (Moy *et al.*, 2015b). It was developed as a pedagogical response through a perceived shortfall of approach for sport teaching and PE but despite the theories limitations and issues with practical implementation, it continues to be researched primarily within Australian schools (Pill, 2014). Harvey *et al.* (2010) suggested that despite Teaching Games for Understanding challenging the beliefs of coaches towards progression, the concept was only influential in parts of Teaching Games for Understanding rather than the teachers encompassing the whole concept.

2.8 Understanding Non-Traditional Methods

Nonlinear pedagogy provides a framework for teaching, with pedagogical practice following a nonlinear pedagogy philosophy underpinned by the principles of ecological psychology and dynamical systems theory (Renshaw et al., 2009). The performance and learning of an individual are constrained by the organism-environment system, ecological dynamics; a system reliant on the structure and physics of the environment in addition to the mechanics in relation to the individual and the specific task constraints. The rationale for the identification and manipulation of constraints for the individual provides the basis for the design of learning programs, based on the perspective that educators should guide learners to facilitate learning through pre-determined action goals. Nonlinear pedagogy has been investigated by scholars throughout the literature including Atencio *et al.* (2014) who explores the concept by practical examples of how complex and nonlinear pedagogies can underpin primary PE lessons through a more beneficial perspective. Nonlinear pedagogy is predicated on the conceptualisation of the learner in sport as a complex

neurobiological system, exemplifying a nonlinear dynamical system in nature (Pinder *et al.,* 2011). It is defined as the application of the concepts and tools of nonlinear dynamics to coaching practice through the manipulation of key task constraints on learners to facilitate learning (Renshaw et al., 2009). Reed and Hughes (2006) considered open (complex) systems in relation to sport; primarily 'how patterns are formed in complex systems with small changes to the system prompting large (nonlinear) changes in the system'. Reed and Hughes (2006) explored the many degrees of freedom in a constant interchangeable state within the system and recognised that specific characteristics within dynamical systems were naturally observed within sport. Renshaw *et al.* (2009) further demonstrate how principles of dynamical systems, in addition to ecological psychology can underpin a philosophy of nonlinear pedagogy.

Separated from the nonlinear approach within the literature, the concept of constructivism has developed within the literature, drawing from social constructivism by Vygotsky (1978) and Pigaet's concepts to form an overall branch of constructivism with constructed learning environments around the learner. Although the two concepts presented by Vygotsky and Pigaet are fundamentally different, both theories follow the understanding that ideas are constructed from experience to create resonance for the learner. Vygotsky (1978)'s approach was criticised for over-positivism in its initial stages, but the underlying principles of the theory have enabled a highly effective method of teaching to evolve through the incorporation of collaboration between the learners and the resultant social interaction (Powell and Kalina, 2009). Chen *et al.* (2007) further supports the acceptance of the constructivist theory by acknowledging the extensive research into cognitive processes to prove that learning and behaviour change are a holistic process, resultant from the learner

actively engaging with the environment to construct knowledge, guided by the cognitive, physical and social constraints.

Despite disparity between the exact definition of constructivism, it is commonly understood as the active involvement of learning, making meaning of abstract concepts by concrete experiences, in comparison to traditional methods where learning is passive through the direct transmission of knowledge. Constructivism provides a framework for progression in PE but requires detailed research applied to PE in order to progress the concept. The basic definition of constructivism has led to notable advances in practice within the field leading to an increase in more student-centred approaches rather than teacher dominated. The purpose of teaching from a constructivist perspective is to allow for students to problem solve to develop a deeper understanding of content and cooperative skills in relation to the task through correlating information they already understand with the new material (Chen, 2002). However, concepts such as Teaching Games for Understanding developed in relation or following the underpinning of nonlinear pedagogy and constructivism spark further debate. Despite recognising similarities between the concepts, Renshaw *et al*. (2015) define Constraints-Led Approach and Teaching Games for Understanding through their differences.

Constraints, defined by Chow (2013) as providing the boundaries for exploration in the learner's search for movement solutions afforded to the individual by the environmental workspace, although normally discussed within nonlinear pedagogy, overlap into constructivism as highlighted by Chen *et al.* (2007). Chow *et al.* (2007) discussed 'The role of nonlinear pedagogy in physical education' referencing both nonlinear pedagogy and constructivist approaches within the article. Both the

concepts within the literature have overlapping defining qualities; the most prominent being the notion of athlete-centred coaching as essential to coaching practice accepted by both nonlinear pedagogy (Chow *et al.*, 2009; Renshaw *et al.*, 2012) and constructivism (Roberts, 2011; Light, 2013) as a key component for teaching philosophy. The expression of terms progresses further than just the original concepts, with teaching methods designed based on both constructivism and nonlinear pedagogy, the line becomes blurred for the underpinning theoretical concepts of methods, opening the possibility for nonlinear pedagogy and constructivism to be discussed as highly alike in concept. The clearest example is displayed through Teaching Games for Understanding, referenced as underpinned by nonlinear pedagogy (Tan et al., 2012) and constructivism.

Aligning with the view from constructivism theories, the learner draws upon previous experience and knowledge to create resonance and understanding in learning experiences, Game Sense is also consistent with constructivism. Stolz and Pill (2014) reference Game Sense as a further refinement of Teaching Games for Understanding in teaching, drawing upon Thorpe's theory that the Game Sense incorporates more than the original version of Teaching Games for Understanding. The emergence of Teaching Games for Understanding prior to the development of substantial theoretical framework in comparison to Constraints-Led Approach, derived from Nonlinear Pedagogy based on theoretical verified concepts of ecological psychology and dynamical systems theory. The harmonious component of the theories however is the holistic approach, the role of a teacher with a powerful focus on learning activities in relation to each individual learner, leading to a prediction of a catalyst of research for pedagogical approaches to learning design due to these complementary approaches. The overriding theme demonstrated is that the differing concepts all

maintain the key component of the learner at the centre of the learning experience, individually within a group setting guided by an 'other'. Vygotsky (1978), defines scaffolding as the guidance required to the elements of the problem that need attending to, strategies to achieve the outcome and the assurance that the learner has the knowledge and ability to seek out the knowledge and skills they currently don't possess. Although there is a recognised move towards non-traditional methods and subsequently an assumed understanding of the beneficial qualities of non-traditional approaches, understanding the similarities of the approaches provides clarification to the difficulties and complexities faced by teachers towards utilising the most beneficial approach in PE, elements of which are evident in a number of approaches.

2.9 Non-traditional Approaches to Physical Education Theoretically

Chen (2002) stated the importance of cognitive disassociation of traditional methods before effective learning of the constructivist approach can take place. Chen (2002) referenced from a study where teachers were trained across a variety of methods, with those trained in a traditional approach finding the transition to nonlinear methods the most difficult than those who had trained in alternative methods. The previous prominent value of skill mastery in PE is being overcome by a significant value orientation for PE curriculum to consider the learning process approach in addition to the ecological integration of learning in specific learning contexts. The non-traditional approach seeks to incorporate learning within realistic context of the game in PE for engagement of the students through modified games depending upon their engagement level (Mastrogiannis *et al.,* 2014). However, despite the clear requirement for improvement, in addition to the large volume of initiatives in PE including but not limited to Teaching Games for Understanding, sport education and cooperative learning, it is recognised that there has been limited change to the

teaching of PE in practice. The curriculum has contributed towards the necessity for acquisition of skill and judged performance, leading to predominance in lessons for team games utilising a limited range of methods for delivery rather than providing a holistic education.

The complexity of conceptualisations, although providing difficulty in understanding, progresses pedagogy through practice and increases the quality of teaching delivered. However, the complexity and variety of approaches provides further complications for those in delivery of the detailed academic theory of learning and teaching. There have been previous attempts to implement constructivist theories in PE lessons but these have faced barriers and failed. These barriers are recognised in the literature, for example through Morgan and Hansen's (2008) study, which explored the general barriers PE teachers face, concluding that teacher confidence was a major issue. This issue transfers into the non-traditional, learner-centred methods of teaching because in comparison, the traditional behaviourist approach provides a highly structured approach for teachers, a considered easier option for classroom management and control of perceived dangerous activities. The chaotic environment presented by constructivist methods of teaching requires a greater depth of pedagogic content knowledge and understanding for subsequent successful teaching to occur.

However, despite the recognised benefits, there are still issues of contextual contestation and negotiation with a considerable number of studies attempting to conclude a singular teaching approach as superior to alternatives rather than exploring the pedagogical process involved (Roberts, 2011) rather than demonstrate the practical application. The superiority debate, although contributing towards the discourse, does not contribute towards the process or the training and prior knowledge

required in coaching and teaching (Roberts, 2011) and subsequently provides little support towards teachers seeking to consider or implement PE academic theory. PE research has primarily consisted of methods and assumptions following a positivist paradigm, which despite improving the conceptual development of the process, has not provided the detailed understanding of the pedagogic process required (Cushion, 2007). This has led to the outcome methods being too simplistic to fully encompass the pedagogic practice process without limiting it (Cushion, 2007), further presenting difficulty in the application of theoretical framework to practical settings within PE and the subsequent decision of the research to not contribute further to the superiority debate. The terminology within the literature presents an issue in itself, with nonlinear pedagogy and constructivism used in such close proximity it opens the question whether they are definitively completely separate or overlapping in nonlinear approach. Through considering nonlinear pedagogy and constructivism as alike in underpinning concept, there is potential for the literature to progress towards the issues presented for teachers practically as opposed to continuing to contribute towards the continuing debate of concepts.

2.10 Transferring Theoretical Conceptualisations to Practice for Physical Education

Primarily those teachers' inclinations towards teaching were based on their own previous experiences of PE in school. Therefore, a difficulty is presented not just in proving the appropriateness of a new method of delivering PE, but additionally, in influencing the teachers to change their beliefs and personal curricular preference as it has a significant impact on the type and quality of PE they deliver. Rovegno and Bandhauer (1997) further supported the necessity for value and belief in teachers in the constructivist approach for implementation, demonstrating the possibility for

success in a disadvantaged context curriculum if the value and belief of constructivism was present. Rovegno and Bandhauer (1997) stated that for successful implementation of an innovation in PE a strong administrative mandate was required or a strong commitment by the teachers to the concept in addition to administrative support. For teachers to accept the values and ideas involved in alternative methods, the concepts must be presented to the teachers in a manner that has resonance with them, inspiring a change of perception. Difficulties in implementing these changes are recognised not only in PE, but also in science where struggled to demonstrate lasting change due to the deeply rooted beliefs of teachers in traditional teaching; issues additionally recognised by Jess *et al.* (2011) in PE interventions.

Previous attempts of a new approach of delivery in PE typically face barriers through the gap between Education material available and its practical application in comparison. Practically, in a classroom environment the teachers are faced with increased decisions and challenges in comparison to the theoretical models providing little practical value without being proven in context. The environment required by alternative methods, such as nonlinear methods, can additionally be difficult to acquire, criticised if 'too fun' resultant from a lack of structure in comparison to traditional methods, but requiring fun for successful learning. For students and teachers alike, fun is considered a primary goal for PE; with fun considered a primary reason for involvement or subsequently lack of involvement in PA when the activities are no longer fun (Garn and Cothran, 2006). There is uncertainty throughout the literature as to what constitutes fun with Garn and Cothran (2006) stating confusion between whether teachers viewed fun as a process goal leading to greater student engagement or a product goal with fun as a valued outcome. However, positive experiences of playing games in primary PE are key to continued participation, with

negative association typically developed through the progression from games to sport. Ineffective learning of movement during primary PE through the recognised structural issues leads to difficulty in the transferal of skills in competitive sport in secondary school and subsequently a negative experience (Kirk, 2005).

Despite the recognised benefits, alternative, nonlinear methods can present an environment that is difficult to balance and master the potential for chaos, leading to an element of danger and concern for the teacher. As the constructivist learning theory began to overtake behaviourism, curriculum designs have also begun to adapt to develop curricula based on constructivist learning theories. It is essential for the success of a curriculum for the teachers to implement it with the high fidelity to ensure the students achieve the designed learning goals. Therefore, teachers are required to understand the learning process, delivering the lessons with confidence, highlighted) as essential for the highest student-learning outcome. Georgakis and Light (2007) explored teacher confidence in relation to Game Sense, concluding an increase of confidence by the teachers in delivering Game Sense after they had completed a unit of study. The increase in confidence demonstrates the requirement for further training of current PE to assist in delivery of novel methods. Training teachers have difficulty understanding the relationship between university taught content, pedagogical knowledge and their relevant underpinning in practical school-based placements.

Success in alternative subject interventions to PE is demonstrated by Mant *et al.* (2007) who carried out research into 'The effect of increasing conceptual challenge in primary science lessons on pupil' achievement and engagement', focusing on 10 to 11-year-old pupils with more cognitively challenging practical and interactive

science lessons. The study had a positive outcome, demonstrating the possibility of an intervention educating teachers through an alternative approach to learning whilst achieving improved results both academically and within the classroom, exampled through engagement and enjoyment of the lessons. Mant *et al.* (2007) referenced the need for achievement in English schools due to the measurement of progress through national tests, impacting teaching into focusing on subjective knowledge and revision to improve test scores. The research of Mant *et al.* (2007) is of greater integrity due to the use of independent evaluators in the review of the intervention, in a trial based across 32 schools. The intervention demonstrates the ability for the re-training of teachers through alternative methods whilst achieving not only improvement in results but additionally the enjoyment of teachers in teaching through increased confidence, demonstrating the possibility for a similar intervention within PE.

2.11 Physical Education Pedagogical Content Knowledge

This section reviews literature on pedagogical content knowledge in physical education and physical education teacher education. Content knowledge is interpreted as knowledge in about and through movement. In this perspective content knowledge is engaged both as a behavioural change and the understanding pre-service teachers are likely to reflect on and how these affect the learners they work with.

Knowledge through movement refers to the knowledge that can be gained from disciplines such as exercise physiology, sociology of sports, biomechanics and sport pedagogy. These are sub-disciplines within primary teacher education.

PCK Constitutes an aspect of educational theory. There are many ways of thinking about and developing theory within specific disciplines. For example, in the natural scientists empirical material is often seen as a necessary element of developing theory

even though this may not be sufficient. This perspective requires rigorous and systematic means of theoretical development. In the social sciences three social scientific principles in the development of theory are discernible. The principles are related to reflectiveness metaphorical thinking and borrowing.

Scholars in the field of social sciences have acknowledged the importance of adopting a reflective attitude to the theories that one uses in consideration of a phenomenon under study. For example Baker (1990) argued that a theory is only one way of viewing the world and that there are other aspects of developing new ideas. This was further supported by Thomas (2007) who claimed that existing theories should be seen as the starting point of further brainstorming rather than endpoints in thinking. In the context of the current study, apart from establishing how CK/PCK theory explains certain aspects of physical education pedagogy, it is critical to equally determine other explanations and assumptions involved in CK/PCK theory in relation to physical education pedagogy.

Within the context of metaphorical thinking, both scientific and popular explanations are underpinned by metaphors or analogies. A theory builder needs to recognize the metaphors, identify the consequences of using the metaphors to explain phenomena and seek their limits (Shoemaker, Tankard and Lasorsa (2004).

With regard to borrowing, Whetten (1989) argued that theory tends to be developed when theorists move from one field to another and explore how a set of ideas works in another field. Theory development commonly involves borrowing a perspective from other fields. This encourages altering metaphors in ways that challenge existing theories. Borrowing is more common and is the cause of theoretical advances. These processes could be applied to discussions of PKC in Physical Education and Physical

Education Teacher Education (PTTE), in order to relate to the content of teacher training. Shulman (1987) identified PCK as one of the knowledge domains of teacher knowledge. He described it as a form of special amalgamation of content and pedagogy which was uniquely the province of teaches and their own special form of professional understanding.

Within physical education scholars have discussed the implication of the application of PCK in Physical Education. Ward and Ayvazo (2016) relate PCK to teachers' selection of instructional models and understanding their learners from past experiences with them.

Teacher preparation programmes define teaching largely in terms of methods processes and procedures with little attention paid to the subject matter of physical education. This has led to the demise of school Physical Education because teachers are good at organizing and managing physical education but have limited knowledge of the subject matter to educate students beyond rudimentary levels. It would be absurd incase trainees are more prepared pedagogically but with insufficient content because of possessing only cognitive knowledge.

2.11.1 Primary Physical Education Curriculum

Physical Education became a subject matter in schools (in the form of German and Swedish gymnastics) at the beginning of the 19th century (Hackensmith, 1966). Its role in human health was quickly recognized. By the turn of the 20th century, personal hygiene and exercise for bodily health were incorporated in the Physical Education curriculum as the major learning outcomes for students (Weston, 1962).

The PE curriculum in primary schools involves the teaching of fundamental movement skills, ball games, athletics, dance and swimming. Fundamental movement

skills are the foundation for the development of more complex and specialized skills used in games, dance and fitness activities. Fundamental movement skills are basic movements that are divided into locomotor, non-locomotor and manipulative skills. Locomotors activities include running, hopping, jumping and skipping. Non-locomotor activities include curling, swinging, and turning while manipulative skills include striking, kicking, and dribbling (Graham, Holt/Hale, & Parker, 2004; KICD, 2002). The games taught at primary level include soccer, netball, volleyball and handball. There is also dance, swimming, athletics and gymnastics. Physical Education is thus compulsory at Teacher Education as it is expected that every teacher should be able to guide the learner to acquire the basic movement skills that are critical in sports as the basis for beginning to discover learner's potential and subsequently nurture it to greater levels.

2.12 Active Teaching and Learning Strategies

Active teaching and learning is a broadly inclusive term used to describe several models of instruction that hold learners responsible for their own learning. It is a process in which learners engage in doing things and thinking about what they are doing in the classroom (Bonwell & Eison, 2005). Active teaching and learning helps to create a sense of purpose in the learning process. It also presents collaboration, a commitment on the part of instructor and learners to enliven the educational environment, in this case learners work together with the instructor to achieve educational objectives (Stewart & Black, 2005). Active teaching and learning strategies require a teacher to relinquish their role as the sole information-dispenser and instead to continually analyse curriculum planning and instruction methodologies (Christie, 2005). A curriculum built upon active teaching and learning is concerned

with the aspect of learning in which learners make sense of experiences in terms of existing knowledge (Michael, 2006).

Learners taught using active teaching and learning strategies score higher and they show improved participation in the learning process compared to those taught using traditional methods. Passive learners fail to retain what has been taught, they lack attention and there is a likelihood that some learners drift off to sleep and others talk among themselves (Dorestanni, 2005). According to TESSA (2010) some of the recommended active teaching and learning strategies cooperative learning, advance organizers, class discussion, use of field trips, project work, role playing, games and simulation, inquiry-discovery methods and problem solving. Literature on these active teaching and learning strategies was also reviewed.

2.12.1 Cooperative Learning

Cooperative learning is an approach that involves organizing classroom activities into academic and social learning experiences. Learners work in groups to complete sets of tasks collectively (Johnson & Johnson, 1999). Rewards to individual learners are usually based on the performance and accomplishment of the whole team rather than on that of an individual team member, which provides an incentive for learners to work together productively. This encourages members to explain difficult concepts to one another so that the group achieves a higher grade (Moore, 2001).

According to Larsen-Freeman (2000) cooperative learning of social studies involves learners learning from each other in-group, but it is not the group configuration that makes cooperative learning distinctive; it is the way that learners and a teacher work together that is important. Cooperative learning is useful not only to help promote cooperative behaviour and better group relations among learners, but also to help

learners with their academic learning. Slavin (1994) stated that cooperative learning classes have significantly outperformed competitive and individualist approaches in academic achievement. As compared to cooperative learning, competitive classroom reward structure allows only a small percentage of learners to achieve the highest rewards regardless of the overall group performance. Learners therefore try to outdo one another and view others' failure as the basis for motivation causing some learners to give up in the face of difficulty. When classroom activities are individualistic, learners work independently and therefore attribute success or failure to personal effort (D'Amico & Schmid, 1997). Moore (2001) points out some of the advantages associated with cooperative learning as higher achievement and retention, increased level of reasoning, development of better interpersonal relationships, increased time on-task, development of positive attitudes towards the subject and development of higher self-esteem.

2.12.2 Advance Organizers

David Ausubel is credited with the invention of advance organizers in 1960. In his study aimed at promoting meaningful learning, he formulated the subsumption theory which stresses meaningful learning by linking the prior knowledge of learners with new information presented in the school setting (Baxendell, 2003). Ausubel demonstrated that the most dependable way of facilitating retention is by introducing appropriate subsumers and making them part of a learners cognitive structure prior to the actual presentation of the learning task. Thus, the introduced subsumers become advance organizers or anchoring foci for the reception of new material. Ausubel recognized the unique need of all individuals when constructing advance organizers; stating that, the construction of organizers depend on the nature of the learning

materials, the age of the learner, and the degree of prior familiarity with the learning passage (Anderson, 2004).

An advance organizer is not like the overviews or abstracts presented introductorily in a textbook, but rather it is a presentation (either verbal or non-verbal) that becomes umbrella for the new materials to be learnt (Paink, 2003). An advance organizer presents a conceptual framework that helps learners to identify and predict the learning that lies ahead. The expectation that lies on the use of organizers is to provide an anchor to which subsequent learning will be attached. Indeed, as Ausubel argues the most important single factor influencing teaching and learning is what a learner already knows (Ausubel, 1978). True advance organizers are bridges that span the gap between what a learner already knows and the new knowledge. New knowledge becomes more readily and stably incorporated in cognitive structures if it is subsumable under correlated pre-existing knowledge.

Since advance organizers are instructional strategies to activate and build schema in a cognitive learning structure, teachers need to consider advance organizers as a tool to preview a lesson, not as the sole means of instruction (Bundy, 2005). Based on the initial response to the material presented by advance organizers, teachers can modify their lessons in order for materials to better fit the prior knowledge of their learners. Further, they can efficiently structure their time and the critical points that need to be covered while simplifying complicated text. This enhances the development of higher order thinking in learners by helping them to relate concepts previously learned to the new material and enabling them to quickly organize their thoughts.

Advance organizers take many forms including a simple oral presentation by a teacher, learners' discussion, outlines, timelines, graphs, maps, charts, and diagrams. The different types of advance organizers include;

i. Expository advance organizers which builds schema by providing new information,
ii. Comparative organizers which helps a learner to recall prior knowledge by activating existing schema,
iii. Narrative organizers which are used to present the new information in form of a story,
iv. Skimming organizers which are used to look over the new material and gain basic overview, and
v. Graphic organizers which are visuals to set up or outline the new information (Kalmes, 2005).

For best results when using advance organizers in teaching social studies, they should be consistent, coherent, and creative. Advance organizers should be straightforward to provide effectiveness and clarity. If an advance organizer is not understood, the effectiveness will be lost. Since the advance organizer's main purpose is to provide clarity and understanding of a new concept, it is best if it is free of distracting information or visuals otherwise, learners may be more confused or disorganized than they would have been originally. This does not mean that creativity should be sacrificed. In social studies learners can illustrate their own advance organizers with relevant pictures to aid in remembering the information. Educators should also creatively introduce the organizers to keep them fresh and exciting. Additionally, clear labelling of concepts and listing hierarchical information helps learners to organize their thoughts and internalize the new concepts while activating prior

knowledge. Some of the benefits of advance organizers are: they enhance learners' motivation to learn, they reinforce and direct learners thinking and they reveal to learners what is going to be learned beforehand.

2.12.3 Class Discussion

A problem, an issue or a situation in which there is a difference in opinion is suitable for discussion method. In this method, ideas are initiated and there is exchange of opinions accompanied by a search for its factual basis (Kochhar, 1992). Discussion is therefore an ordered process of collective decision-making. It seeks agreement, but if reached, it has the value of clarifying and sharpening the nature of the agreement (Bennaars, Otiende & Boisvist, 1994). Discussion method is an appropriate method in teaching and learning social studies as it is a thinking together type of learning. It is a teaching and learning process which requires teamwork among learners. It is a problem solving technique in a learning situation through sharing information and clarifying ideas to arrive at a consensus or agreement. A discussion is good in starting of a unit; this is because a teacher will learn whether learners have opinions, and what these opinions are. This is very important especially when using the constructivist learning approach because a teacher needs to know learners' prior knowledge before they begin a unit. Discussion at the middle of the lesson can be a way of assessing learners understanding of a unit.

Learners should be more actively involved in a class or group discussion than a teacher who initiates it. In this case a teacher guides learners. To have a successful classroom discussion, a teacher should carefully choose a task for discussion, prepare a worksheet to guide learners in each group and provide each group with the required learning material. A group of at most five learners is suitable for discussion. Each group should have mixed-ability learners; and appoint a secretary to record key points

and a chairperson to control the discussion. A teacher should go round the classroom to monitor the progress of a discussion in the various groups. Before the end of a lesson each group should be given an opportunity to make a presentation to the whole class after which a teacher summarizes the main points that have been taught. Some of the Importance of discussion method include; it allows for the participation of all learners, it encourage learners to develop listening skills, it encourages good teacher-pupil relationships, Through discussion, learners develop the skills of self expression, encourage slow learners, and enhance retention of content taught.

2.12.4 Fieldwork

According to Kiruhi et al (2009) fieldwork is a teaching and learning strategy in which learners are given an opportunity to make visits, trips or excursions to a learning site outside the classroom such as a river, factory, museum or any other relevant site in the community. Field trips are organized by a teacher to have a class visit relevant sites in order for them to find out for themselves the first hand information. Thus, learners are taken outside the classroom to observe, record, analyse and interpret for themselves what they see with the help a teacher. As such, learners are encouraged to seek a linkage with what they have learnt. This is particularly so where field activities are meaningful and worthwhile to the extent that they engage learners in using the community as learning ‘laboratory’. Despite its being singled out as an important teaching technique, fieldwork faces a number of constraints in its application, ranging from inadequate equipment, lack of time, large number of learners to inadequate support from school administrators in financing the field trips.

2.12.5 Project Work

A project is an activity carried out by an individual learner, or group of learners, over a specified period of time, from start to completion under the guidance of a teacher. A project demands a learner's personal initiative, effort, skills and planning (Kiruhi et al, 2009). Project method involves active participation by learners and is a co-operative study of a real life situation. Learners learn by doing and hence they have an opportunity to develop attitudes and values through their own activities. Project method enables a learner to understand and perhaps resolve some problems or conflicts which impact on them. Learners work on authentic problems through project work that enable them to interact with the environment. A teacher's role is that of an advisor and as a source of information when needed.

Project method is an approach based on constructivist principles. According to Thomas (2001) project based learning utilizes complex tasks, based on challenging questions or problems that involve learners in design, problem-solving, decision making and investigative activities that give learners an opportunity to work relatively autonomously over an extended period of time, and culminate into realistic product or presentations. The key features are that the content or focus of the study is authentic; learners are encouraged to think and reason independently, the work may involve cooperation and collaboration with others.

Thomas (2001) suggests that learning that arises from the project method tends to be retained more than learning acquired as a result of didactic teaching methods. Such learning is also seen as being more flexible and adaptable to new situations. Projects are important in the learning of social studies as most of them require practical work carried out in appropriate learning environments such as a weather station, a farm, valley, river or in the laboratory. In this case learners work to develop their skills of

observation, collecting and analysis of data, measuring, recording and drawing conclusions. The project should end with a presentation in the form of a report, a display or demonstration. Evaluation of the project can also be done by both the teacher and the learners. A learner should estimate the quality of what they have done before a teacher gives her/his evaluation. This evaluation should be done in the light of plans, difficulties in the execution of the project and the achieved results. This process is useful because as a result of the project, learners can know the value of information, interest, skills and attitude that have been modified by the project.

Project work enable learners to develop various skills such as writing, reading, measuring, observation, drawing, construction, organization and presentation. It also develops team spirit and group skills. Project work has a 'real world' orientation and promotes meaningful learning by connecting new information to learners past experience and prior knowledge, learners develop the ability to organize and accept responsibilities. It is also suitable for developing learner's wide range of both cognitive and non-cognitive objectives (Kiruhi et al, 2009).

2.12.6 Role Play

Role playing is a method that promotes both interactive and active learning. Learners act out different roles in a specific situation by assuming the identities of other personalities and acting the way they think the personalities would have acted in those situations (Kiruhi et al, 2009). For example learners could role play the personalities of the District Commissioner, the speaker of the national assembly or even the president. MOEST (2009) described role play as a teaching and learning strategy whereby learners are given an opportunity to act a scene based on their experiences. Role playing provides an active situation in which learners not only participate but must interpret, thus developing feelings, attitudes and reinforcing knowledge, an

exceptionally good technique to focus quality time on task (Barth, 1993). Role play helps learners to be problem solvers and increase interest in learning. Learners love role playing, they enjoy taking on the identity of others. In the process they learn valuable social studies skills such as developing empathy and seeing situation from multiple perspectives. The way each individual performs his/her role to accomplish the objectives, is the main focus of this teaching method.

Role play is a good way to get learners to consider an issue from different perspectives. It is a very successful approach in teaching social studies provided that learners are fully engaged. Learners need to be convinced that their role is appropriate and they need to know what a teacher requires of them and why they are role playing. Role play provides learners with an interesting awareness for multifaceted issues, help them engage with concepts, use their imagination and express themselves.

2.12.7 Games and Simulation

Games and simulation is a teaching and learning strategy in which learners are presented with a hypothetical problem which resembles a real life situation and they are asked to work a situation through skillful application of the rules of the game. In games and simulation learners try out possible solutions to the problems and examine the advantages and disadvantages of each before finally recommending a particular solution (MOEST, 2009). In games and simulation any serious risk that may be associated with a real situation is removed. The level of abstraction or complexity of a real situation is also reduced making it easier for learners to grasp the underlying concepts (Aldrich, 2004).

As a method of teaching and learning social studies, games and simulation could involve the use of models to explain some principles, structural role plays, interactive

videos or computer programs. Games and simulation empower learners to apply previous knowledge, skills, insights and attitudes. It also promotes the development of learners critical and creative thinking as well as interpersonal and social skills. Games and simulation may be used as an introduction to a lesson to help learners link what they already know with the new information to be presented. They can also be used to motivate learners. During the lesson games and simulation can be used to teach new materials. Towards the end of a lesson games and simulation can reinforce learning with factual materials such as textbooks, statistical data, ensuring individual participation and in summarizing the main points (MOEST, 2009).

2.12.8 Inquiry- Discovery Method

In inquiry- discovery method, learners learn to recognize, characterize what a solution would look like, search for relevant information, develop a solution strategy, and execute the chosen strategy. It provides learners with opportunities to develop hypothesis, to answer questions and contribute to the development of a life-long love of learning. Learners propose issues or problems, gather data and make observations to develop hypothesis, confirm or refine their hypothesis, and explain or prove their problems (Mayer, 2004). Inquiry-discovery requires learners to investigate an issue or a problem by active means, obtain pertinent information, interpret causes and effects where relevant, and arrive at a conclusion or solutions. The consensus regarding inquiry-discovery learning is that it is most effective when; the process is carefully structured, learners have prerequisite knowledge and skills and teachers provide necessary support during the investigation.

Brunner (1990) defined discovery learning as an approach to instruction through which learners interact with their environment by exploring and manipulating objects, wrestling with questions and controversies, or performing experiments. The idea is

that, learners are likely to remember concepts they discover on their own. Brunner also adds that being a constructivist approach, discovery leads learners to draw their own past experiences and existing knowledge to discover facts, relationships and new truth to be learnt. Learners construct their own knowledge by experimenting with a domain and inferring rules from the results of these experiments. However, the basic idea of this kind of learning is that, learners can design their own learning in the domain and infer the rule of the domain themselves by constructing their own knowledge. It is assumed therefore that learners understand the domain at a higher level than when the necessary information is just presented by a teacher or an expository learning (Joolingen, 1999).

In discovery learning a teacher guides learners throughout the learning process by posing a series of questions whose responses would lead to the understanding of a concept before it is explicitly stated. Learners act as detectives as they solve concept-attainment activities in stimulating learning environment. This teaching and learning approach is believed to increase retention of materials because the learners organize the new information and integrates with information that has already been stored.

Discovery learning allows a learner to take a leading role in his/her own experience. A learner becomes an active participant who solves problems which he understands through the process of structuring his own experiences. A teacher becomes a facilitator and a guide, making it possible for learners to reach maturity-agreed-upon goals. A teacher also serves as a resource person to stimulate, motivate, clarify, and explain concepts. The atmosphere in which such teaching takes place should be informal and non-threatening. In order for discovery learning to be effective, the environment (including the teachers' attitude) should contribute to, rather than detract from the attaining of objectives. Instead of forcing his ideas of content, a teacher

attempts to keep his hands off learning process whenever and wherever a learner can carry it alone Muir-lereche (2006) argues that in discovery learning the environment includes both freedom and structure with freedom having the upper hand. The content may very well be propositional truth in a general context, waiting in the proper place for the learner to track it down, confront it, and capture it for his own.

2.12.9 Problem Solving

Problem solving is a technique whereby learners think about, try to understand and evaluate information in order to find the solution to a specified problem. It requires a learner to arrange, classify, sort, sift and interact with content of a discipline. The goals of the exercise are to be able to think out logically, answer or find suitable patterns that will satisfy the given problems (MOEST, 2009). According to Kiruhi et al (2009) a problem is a situation in which an individual wants to reach a goal but has not yet identified a means for reaching that goal. Problem solving then is the identification and use of knowledge, skills, effective responses and behavioural activities that result in the achievement of the goals. It is an effective approach to teaching higher order thinking process, helping learners to construct their own knowledge and the social and physical world around them. The essence of problem solving consists of presenting the learners with authentic and meaningful problem situation that can serve as a spring board for investigation.

Problem solving offers a model of learning which is considered closer to real-life. This real-life is twofold; firstly, the problem or the issues are based on real-life scenario; secondly, the process of team working, research, data collection and critical thinking are those which will be used by learners in their career. Learning through problem solving is much more effective than didactic method of learning in creating in learners' mind set a body of knowledge that is useful in the future. In problem

solving learners are presented with a real-life issue that requires a decision, or with a real-life problem that requires a solution. The problem of the issue is often intentionally left ill defined and ‘messy’ so that there is no clear path or procedure to follow. Learners typically work in small collaborative groups. A teacher has the general role of a facilitator of the group discussion, but does not direct or control the investigative process.

Active teaching and learning strategies enable learners learn meaningfully remember more and derive greater enjoyment in the process of learning. In active teaching and learning learners should engage in higher order thinking tasks such as analysis, synthesis and evaluation. Within this context, active teaching and learning must involve instructional activities involving learners in doing things and thinking about what they are doing.

Active teaching and learning may well be the most important contribution to education. The key characteristics of active teaching and learning strategies are;

i. There are high levels of participation, learners usually find active teaching and learning activities energizing and are likely to engage more with the subject matter as a result.

ii. Use of prior experience or knowledge. All learners have previous experiences and knowledge of some kind and active strategies offer them the opportunity to make informal connections with things they have already learned.

iii. Adoption of new perspectives and positions .The opportunity to discuss topics with others and to listen to or address other points of view, for example in group work or role play may often lead to the revision of existing perspectives and to enhanced learning opportunities.

iv. Contestation of values and assumptions from different disciplines. Many of these strategies are appropriate in inter-disciplinary contexts where learners may need to address a problem from a range of viewpoints. In collaborating with each other, they are more likely to have the opportunity to learn to debate and challenge basic assumptions and values.

vi. Openness with respect to learning outcomes. Active teaching and learning strategies will often yield unanticipated outcomes; there will be some learning that takes place, that has not been planned for and this can be rewarding for both the learners and the teacher.

vii. There is peer support and peer learning. Collaborative activities such as group work or simulations provide learners with opportunities to learn from, and support each other in ways that are not facilitated by more formal, teacher-centred approaches.

viii. Critical reflection on action and experience. By sharing knowledge and experiences, by being encouraged to take a different perspective on a particular topic for example in debate learners may learn to reflect critically on the things they do and say.

ix. Greater ownership of and responsibility for learning. Active teaching and learning strategies may encourage learners to become more self-directed and self-motivated. By taking on a more enquiring and autonomous role, they are more likely to develop a sense of ‘ownership’ in relation to their learning and to be able to build on this independently in later life.

x. Development of generic communicative skills for example listening, debating and collaborating. Active teaching and learning strategies afford many

opportunities for learners to develop interpersonal and communicative skills, these skills are essential to personal effectiveness in a range of contexts

2.13 Teaching Approaches

Teaching Physical Education encompasses multiple objectives that range from uniformity and synchronization of performance in rowing or precise replication of models. These various objectives require a range of teaching styles, each with its own structure of teaching methods that invite a particular learning behavior. Teaching styles represent two basic human thinking capacities: the capacity for reproduction and the capacity for production (Muston, 1966). The former seeks replication of ideas, movements, known models, and procedures whereas the latter relies on the discovery of principles, rules, laws, new knowledge, new movements, or the creation of new models.

The Spectrum theory has been greatly upheld over the years in teaching Physical Education and other subjects; it is constructed from a statement that teaching is governed by a single unifying process which is decision making. Every act of deliberate teaching is a result of a prior decision. Decision making is the central or primary behavior that governs all behaviors that follow: how we organize students; how we organize the subject matter; how we manage time, space, and equipment; how we interact with students; how we choose our verbal behavior; how we construct the social-affective climate in the classroom; and how we create and conduct all cognitive connections with the learners. All these concerns are secondary behaviors that emanate from, and are governed by, prior decisions. (Muska, 1966)

This approach to the study of teaching was novel in that, the options along the continuum not only presented the range of significantly different teaching options, but

also highlighted the inherent learning opportunities of each landmark teaching style. This approach reduces idiosyncratic preferences and fads as the bases for understanding teaching and moves the conversation about pedagogy to the structure and process in teaching.

The spectrum's theory continues to influence pedagogy because it offers a universal, comprehensive body of knowledge about teaching and learning. The theory, which is based on decision-making, delineates landmark teaching and learning styles or behaviors. Each successive behavior is derived from the systematic, cumulative shifting of decisions from teacher to learner. The cluster of decisions shifted in each style creates a distinctive set of learning objectives; consequently, each teaching style is a landmark decision-relationship that leads both teacher and learners to a specific set of learning objectives and outcomes. A teacher's primary concern is the learner. They have to teach in order for their students to learn and therefore use some teaching aides such as books, visuals, and other suitable materials. There are five main pedagogical approaches that can enhance the learning process.

i) Constructivism or Constructivist Approach

The constructivist theory posits that knowledge can only exist within the human mind, and that it does not have to match any real world reality (Driscoll, 2000). Constructivist teaching is based on constructivist learning theory. It is premised on the belief that learning occurs as learners are actively involved in a process of meaning and knowledge construction as opposed to passively receiving information. Learners are the makers of meaning and knowledge. In the context of teaching Physical Education, conceptualization of the performance is a critical component of the learning process. The pre-service trainee has the task of ensuring that the

demonstration and explanations made to the learner form a conceptual frame that causes the individual to execute the activity in the way they understand it to be. Often, this is what is seen as variance in performance that brings out the aspect of creativity and individual style as pupils execute the same activity.

ii) Collaborative Approach

Collaborative learning is a situation in which two or more people learn or attempt to learn something together. Unlike individual learning, people engaged in collaborative learning capitalize on one another's resources and skills. More specifically, collaborative learning is based on the model that knowledge can be created within a population where members actively interact by sharing experiences and take on asymmetrical roles. This may also involve asking one another for information, evaluating one another's ideas and monitoring one another's work. The learning process for Physical Activity is dependent on interaction for acquisition of the necessary skills. The pre-service teacher trainee learns to engage learners so that they can play complimentary roles in execution, observation or participation during the lessons. The collaborative approach embeds the spirit of cooperation and teamwork from skill development which progressively grows to be a major attribute in sports.

iii) Inquiry-Based Approach

Inquiry-based learning is a form of active learning that starts by posing questions, problems or scenarios—rather than simply presenting established facts or portraying a smooth path to knowledge. A facilitator often assists the process. Inquirers will identify research issues and questions to develop their knowledge or solutions. This kind of learning includes problem-based learning, and is generally used in small scale investigations and projects, as well as research. The inquiry-based instruction is principally very closely related to the development and practice of thinking skills. The

pre-service teacher trainee in pursuit of learning how to teach may develop their practice by engaging in self-study to learn more about their teaching and their students' learning. They should make reference not only to the content to be taught, but the manner in which it needs to be taught and made more explicit for the learners. This would enable the trainee to better conceptualize about teaching while appreciating the impact of their practice in finding new and different ways for their pupils to learn. Tidwell (2000) confesses,

> "What I find most fulfilling, intriguing, and difficult about this type of self-study is that it requires me to get very close to my own teaching and to my own thinking. It forces me to ask questions that are not always easy to answer, and this can be a painful process" (p. 41).

iv) Integrative Approach

Integrative learning is a learning theory describing a movement toward integrated lessons helping students make connections across curricula. This higher education concept is distinct from the elementary and high school "integrated curriculum" movement. Integrated studies involve bringing together traditionally separate subjects so that students can grasp a more authentic understanding. Interdisciplinary curricula have been shown by several studies to support students' engagement and learning. Specifically integrating Science with reading comprehension and writing lessons has been shown to improve students' understanding in Science, English Language and the Arts. In countries such as Netherlands, Belgium, Germany and Scandinavia, pedagogy is more than simply teaching. Van Manen (1999), recognizes Pedagogy as the art and science of educating children in which there is a focus on the relationship between learning and teaching such that one does not exist as separate and distinct from the other.

Korthagen (2001b), in building further on the place of relationship in conceptualizing and understanding of pedagogy, focuses on the importance of self-understanding and connectedness. He emphasizes on the development of self-identity and the manner in which that impacts pedagogy. According to Kohnstamm (1929), “many durable learning experiences are rooted in the I-you relationship between teacher and student, in genuine personal encounters in which both are, within the here-and-now, in contact with their inner selves" (p. 264). Thus, a teacher's norms and values, and the extent to which they are enacted in practice, influence the manner which students might develop their own. Thus personal relationship between teachers and students is crucial as identity formation and personal growth combine to shape the nature of pedagogy itself.

v) Reflective Approach

Minott (2009), defines reflection as careful consideration or thought; it is a process of disciplined intellectual criticism combining research; knowledge of context, and balanced judgment (critical thinking) about previous, present, and future actions, events or decisions. It is an approach to teaching, learning and problem solving that uses reflection as the main tool. Teachers reflect on their teaching practices, analyzing how something was taught and how the practice might be improved or changed for better learning outcomes. Some points of consideration in the reflection process might be what is currently being done, why it's being done and how well students are learning. One may use reflection as a way to simply learn more about their own practice, improve a certain practice or to focus on a current problem students are having.

Reflective teaching is a response to past experience and involves conscious recall and examination of the experience as a basis for evaluation and decision-making and as a

source for planning and action. The process of reflective teaching involves mapping or recollecting a teaching event by observing and collecting evidence (Richard, 1990). The activity calls for reliable methods of recollecting past experiences such as:

a) **Journaling:** Teachers keep a journal of their day-to-day teaching experiences for the purpose of evaluating their practice. The journal contains details on efficiency of the teaching methods and materials used, content and status of its delivery, consistency of the lesson plan and how the learners responded during the lesson. More details can be added while journaling though the emphasis is on that moment of reflection

b) **Student Survey:** The teachers can carry out a simple student survey tailored to yield specific results in regards to learning activities and experience. The survey can have questions aimed at providing basic information on learners' experiences, attitudes and perceptions. For example, a survey on how learners grasp concepts during lessons can prompt student-friendly adjustments by the teacher.

c) **Multimedia Documentation/ recording:** A recording device can be strategically placed within the classroom to digitally document the learning activities from which the teacher and learners can collect information on how they have been conducting the learning activities. For example, in physical education, a recording of both theory and practical lessons can provide a precise basis for the teachers and learners on what to tweak or adjust during the learning activities.

2.13.1 Assessment modes

Assessment is a process in which information is gathered from several sources to make decisions on a student's performance from an educational perspective (Lund and Tannehill, 2010). Physical education should promote enjoyable physical activity, help develop motor skills, and provide opportunities to engage in a wide range of physical activities, both now and in the future (CDC, 2005; NASPE, 2004). Assessment in Physical Education is done using standardized fitness tests, as well as assessment modes that gauge higher-order cognitive goals, skill acquisition, and personal and social development for lifelong physical activity. It is essential to note, however, that the former are not considered valid assessments of student achievement. Further, fitness testing has previously been shown to decrease positive attitudes toward Physical Education (Mercier & Silverman, 2012), Thus, alternative assessments should be considered comprising of both formative and summative purposes.

Different forms of assessment can be applied including integrated assessment, formative assessment, authentic assessment, peer assessment and self-assessment (Lopez-Pastor, Kirk, Lorente-Catalan, MacPhail and Macdonald, 2013). The critical component of each of these is feedback. Ultimately assessment influences and defines the teaching and learning process, referred to as the "backwash effect" (Chan, Hay and Tinning, 2011). For assessment to be focused and productive, it requires the cooperation of both the pupils and the teacher (Wiliams, 2011). According to Hay and Penny (2013,81), assessment literacy "refers to capacities of teachers and students to engage with and utilize assessment practices and outcomes in a way that optimizes learning possibilities. Involving the pupils in their own assessment develops their

autonomy (Fernandez, 2011) and enhances their ability to reflect and conceptualize their participation for better performance (Henninger & Carlson, 2011).

Assessment for learning (AfL) which in its design and practice prioritizes, "***to serve the purpose of promoting student's learning***", (Black *et al.* 2002) seeks to affirm the importance of determining that the learner has gained from teacher instruction. AfL therefore is based on "what works" in the teaching practice. It should of essence be integrated in the teaching and learning process in order to adapt teaching to the needs of the learner (Black and Wiliam, 2009). Assessment carried out through observation is seemingly very simple as it focuses on deciding whether the learner can execute the action correctly (Lopez-Pastor et al., 2013). The focus is mainly on motor skills and fitness. The frame of this study is on the impact of pre-service teachers PCK on performance of learners. It, therefore emphasizes the importance of setting clear standards and parameters for rigorous and useful assessment for skills acquisition (Richards & Wilson, 2012).

2.13.2 Facilities and equipment for Physical Education

A wide range of physical facilities and sports equipment are essential for the effective implementation of Physical Education and Sports in the primary schools resources are required including play grounds, gymnasium, playing fields and courts, balls and nets. But most fundamental is the qualified teacher who can effectively articulate the content designed to be taught to learners in various classes (KIE, 2004). These are essential components of this study as they impact on how the pre-service teacher undertakes the practical teaching session in physical education.

2.13.3 Current issues in Teacher Education

The current national primary teacher training programme is a certificate course based on the Primary Teacher Education (PTE) curriculum developed in 2004 by KIE (currently known as Kenya Institute of Curriculum Development). To qualify for the programme one should be a graduate of Kenya Certificate of Secondary Education (KCSE) with a minimum mean grade of C plain. Additionally, one must also have obtained a minimum of grade D plain in Mathematics and C- (minus) in English.

Over the years grades for entry into teacher training have been reviewed upwards. Unfortunately, raising teacher grades and academic requirements for entry into PTTCs has not resulted in better teachers as the poor student learning achievements reported in various studies reveal (SACMEQ, 1998; UWEZO, 2010; KNEC, 2010; RTI, 2009). This points to the need to pay attention to what actually goes on in PTTC classrooms particularly with regard to the types of knowledge the curriculum and teaching and learning in these institutions is emphasizing.

Many policy-makers today still question whether, and to what extent, teacher education makes a difference (Cochran-Smith, 2004; Darling-Hammond, Wei & Johnson, 2009). As Fullan, Galluzzo, Morris and Watson (1998) state:

> "Despite the rhetoric about teacher education in today's society, there does not seem to be a real belief or confidence that investing in teacher education will yield results. Perhaps deep down many leaders believe that teaching is not all that difficult. After all, most leaders have spent thousands of hours in the classroom and are at least armchair experts." (p. 2).

According to DeCorby et al. (2005), HPE is generally believed to be of value in the elementary curriculum; however, while it receives fairly positive reviews from its "small clients" (Graber et al., 2008, p. 154), adults' perceptions of HPE are complex and often contradictory (Graham, 2008). While parents mostly think favorably about

their child's HPE programs, Sheehy (2006) revealed that when asked about the nature of those programs, parents knew very little about what actually went on in the classes. Meanwhile, the elementary classroom teachers who are mostly resto value HPE but for reasons that many physical educators would claim are misguided. HPE elementary classroom teachers sometimes feel that the time spent on HPE could be better spent on instruction in other areas of the curriculum (Morgan & Hansen, 2008a).

> "Being a teacher educator is often difficult in most places, there is no culture in which it is common for teacher education staff to collaboratively work on the question of how to improve the pedagogy of teacher education." - Korthagen (2001a, p. 8).

In today's educational contexts, it is not uncommon to hear or read about teacher educators' frustrations with the constant challenges and barriers that are present in teaching and in preparing teachers, both in a general sense and with specific reference to HPE. For example, formal teacher education programs can be seen as lacking direction (Kosnik & Beck, 2009a), a waste of time, or programs that prepare teachers for socialization rather than what many consider to be the day-to-day necessities of teaching (Hansen, 2008). What student teachers learn in their programs has been cited as being remote from practice, demonstrated by a tension between university-based teacher education coursework and field-based practice teaching experiences (Labaree, 2004; Levine, 2006; Zeichner & Tabachnick, 1981). These criticisms are compounded in HPE Teacher Education (HPETE) due to the limited amount of time student teachers spend learning to teach HPE. Consequently, elementary classroom teachers consistently cite inadequate teacher education as one of the major barriers that inhibits their teaching a quality HPE program (Dwyer et al., 2008; Faulkner et al., 2008).

The challenges to teacher education and HPE mean that both are continually asked to justify their status and as such, might be considered marginalized within their spheres.

Teacher education is marginalized within the university but for HPE the marginalization is two-fold; it is marginalized within schools and within teacher education (Collier, 2006). In response, the challenges listed and critiques aimed at both fields continue to be researched and debated and it appears that only recently have feasible and practical solutions to several problems emerged. This study seeks to add to this pool of knowledge and make a contribution to improving the training of teachers for Physical Education in Kenya.

2.13.4 The Image of an Ideal Physical Education Teacher

In the teaching profession, attempts have been made to identify the characteristics of effective teachers. The teaching and learning process is a complex one. It demands various qualities on the part of the teacher if learning has to take place. Some of the outstanding characteristics of effective teachers include being an authority in the subject matter as well as the methods of imparting the knowledge (Adeyemi, 1989). The knowledge of the subject matter and the methods of instruction are not enough to make one a good teacher. According to (Adeyerni, 1989) a teacher must also have certain other characteristics before he can be regarded as a good teacher.

Ellena, Stevenson and Webb in Combs (1970) surveyed the views of the teachers in the United States and came up with a list of characteristics of a good teacher. According to them, a good teacher should:- know the subject, know much about related subjects, be adaptable to new knowledge, understand the process of becoming, recognize individual differences, be a good communicator, develop an inquiry mind, be available, be committed, be enthusiastic, have a sense of humour, have humility, be sincere and honest, act with integrity, be creative, be versatile, among others.

It is apparent that the teacher should be an expert in the subject area in terms of knowledge, pedagogy as well as having outstanding character. Adeyemi (1989) sought to find out from social studies undergraduates, the qualities a social studies teacher should possess. The findings in order of rank were:- knowledge of subject matter, superb method of teaching, self confidence and effective communication skill, states objectives of teaching, fair examination results, encourages the art of inquiry and questioning, gives notes to students, welcomes divergent opinions, gives assignments, marks and returns them in time, fair and impartial, among others.

The author, therefore, concluded that social studies students perceive the good social studies teacher as one who has a rich and extensive knowledge both in breadth and in depth about his discipline, well informed and one, who can share his knowledge through effective method of teaching. According to Osibodu in Adeyemi (1989), teaching should be seen as an important process for imparting knowledge. Otherwise of what use IS knowledge that is not imparted?

Having dealt with the characteristics of an effective teacher, it may be helpful to consider the theoretical background to the study of personal characteristics of teachers, especially in physical education. Physical Education refers to that part of total education, which contributes to the development of the individual through the medium of physical activity. It is defined as the school-centred programme of physical activities (Singh, 1982). However, sport refers to the formal and informal competitive, recreational, as well as physical exercise both within and outside the school. For purposes of this paper, physical education refers to organized physical activity (sporting) both within and outside the school (Njororai, 1994). Physical Education teachers are charged with the responsibility of not only teaching in the

formal classroom situation, but also of administering and managing the school based sporting activities as well as in the community.

Physical Education teachers are leaders. It is, therefore, pertinent to consider their personal characteristics within the scope of social psychology of leadership. The modem view of leadership in social psychology emphasizes the fact that the situation, the activity and the people involved may demand different leadership qualities and attributes if one has to be effective (Kane, 1975). This situational approach therefore acknowledges and approves the active role of the followers if leadership is to be effective. The personal characteristics that bring success in one sport context may not be the same required in a different one. Diverse situations require that the teacher relies not only on his personal attributes, but also personal resources that will facilitate effective interaction with the learners in continually changing situations. According to Fiedler in Kane (1975), leadership may depend on both stable characteristics and other variable factors such as the ability of the group member, the nature of the task and the social context, which may require special situational specific transactional abilities from the leader. This argument is in line with approaches in social psychology of leadership which focus their attention on the legitimacy of the leadership position, his influence and responsibility for initiating structure, innovation and on leader perceptiveness (Kane, 1975).

The process of teaching and learning involves the interaction 'of the teacher and the learner. In Physical Education (P.E.), a teacher, on most occasion, goes to the field, gives instructions, supervises the performance and dismisses the learners back to class and then walks away feeling that learning has taken place. In the school situation, the P.E teacher plays a significant role in introducing the

sports skills to the learners both in class and during sports time.

The Physical Education teacher is therefore, involved to some extent in influencing the sports involvement, sports skills learning and the sports performance 'of young people (Kane, 1975). The extent of involvement in sport by the learners would be a pointer to the effectiveness of the teacher. Additionally, it can be argued that effective physical education teachers may have much in common with respect to personal characteristics (Ibid).

Kane (1975) carried out a study on the personality characteristics of men and women physical education teachers drawn from secondary schools in England and Wales. The teachers, who were representatives of a wide teaching experience and age range, were asked to consider and rate twenty four items relating to a number of personal attributes and abilities. The attributes that were ranked among the top six included ability to gain respect of pupils, ability to communicate ideas, ability to inspire confidence, knowledge of subject matter, honesty and integrity and capacity for sustained hard work.

These attributes were basically on the operational side of teaching. Kane's findings concur with Singer's (1972) list of attributes including: intelligence, dedication, character, ability to communicate and ability to organize. The qualities such as extroverted personality and general cultural background, were rated lowest by the teachers.

A study by Hendry (1975) on the physical educator's role showed that while pupils perceive many admirable qualities in the physical educator, they are also aware of his aggression, quick temper and the greater attention given to the more highly skilled performers. Teachers who tend to identify with certain pupils produce a differential

socialization process with some pupils showing some indifference, while successful performers show more dedication and aggressive achievement. According to Hendry (1975), a teacher who also had a successful sports team was accorded higher status.

Knowledge of personality of the individuals involved in the teaching and learning process IS vital as such information can be put to positive use, including:-

i. A better understanding of an individual's behavior tendencies;
ii. Teacher - interactions can be better effected by producing situations which can eliminate undesirable consequences;
iii. Learners' manipulation may be improved to the extent of trying to maximize learning, training, participation and better performance;
iv. Perception of the learners' abilities vis-a-vis their personality and skill performance, and
v. Repeated assessment of personality changes can help in readjusting the teacher - learner interaction process (Lewellyn and Blucker, 1982).

The studies reviewed seem to point towards certain relatively stable behavioral supports that physical education teachers share and require for effective functioning. Kane (1975) summarizes the factors that comprise the personality resources necessary for the successful teacher/coach as dedication, character, sensitivity to others and ability to communicate and organize. These findings emphasize the pastoral and broad educational commitment of the teachers.

Technology is about solving practical problems, thus it involves “creativity rather than an investigatory activity” (Gumbo *et. al*, 2012). Technology subject contributes towards learners’ technological literacy by giving them opportunity to develop and apply specific skills to solve technology problems and to understand the concepts and

knowledge used in technology (Department of Education [DoE], 2003). It also gives learners opportunity to interact with each other within teams where they develop technological solutions and explore both the positive and negative impacts of technology.

The content of technology subject allows learners to understand the concepts and principles used in technology. According to Khumalo (2004) teachers do not have enough content knowledge to teach technology because most were not trained in technology at the time of implementation. Gumbo and Makgato (2008) also found that teachers are being blamed for their apparent inability to prepare learners with the content knowledge and skills of technology. They further argue that technology could be better taught and learnt if teachers have an understanding of what should be taught and learnt. Teachers should also have a thorough understanding of how teaching and learning occurs in technology classroom.

This study was underpinned by the theory of constructivism which promotes active participation and variety of teaching methods such problem-based learning, inquiry –based learning, project-based learning, case-based teaching, and discovery based learning.

These constructivist methods of teaching and learning were used in this study to measure the effectiveness of teaching and learning of technology in classroom or laboratory. Furthermore, the study was underpinned by Pedagogic content knowledge (PCK) framework which also encompasses the principles of constructivist theory, particularly on the use of relevant methods in teaching and learning technology subject. Pedagogic content knowledge first according to Newsome (1999) PCK is a combination of content and pedagogy within a specific context. As interpreted by

Schneider and Krajcik (2002) content knowledge encapsulated among other aspects accuracy of content presentation for concepts, whereas pedagogical knowledge links ideas across lessons using artifacts which assess the ideas put forward by students.

There are several approaches to constructivist theory with major branches built on philosophical theories of learning and those focusing on psychological theories (Olsen, 1999)**.** The constructivist theory of learning is reflected in the developmental theories of Piaget (Piaget, 1972), Dewey (Dewey, 1997), Bruner (Bruner, 1961) and Vygotsky (Vygotsky, 1978). In Cognitive constructivism from the work of Piaget, a student reactions to experience lead to learning. From the work of Vigotsky, social constructivism play important role in the construction of meaning from experience (Prince and Felder, 2006). Teachers should have understanding of constructivist theory, principles and pedagogy in order to provide effective teaching and learning in the technology classroom. Although there are several approaches to constructivism, the common perspective is that construction of knowledge by students is basically a learning process that involves change (Olsen, 1999). Thus, knowledge construction is the process of learning. In implementing a constructivist classroom the teacher should (1) influence or create motivating conditions for students (2) take responsibility for creating problem situations (3) foster acquisition and retrieval of prior knowledge and (4) create the process of learning, not the product of learning (Olsen, 1999). Constructivist classroom should reflect active participation and deep learning through inquiry based approach as opposed to surface learning. Proponents of constructivist theory provide the following principles for effective teaching and learning:

1. Teaching should begin with content and experiences familiar to the students, so they can make connections to their existing knowledge structures. New knowledge should be presented in the context of real-life applications, rather

than abstract.

2. Knowledge should be presented in a manner that does not change students' cognitive models drastically. In Vygosky's words, it means students should not be forced outside their "zone of proximal development" the region between what they know/can do independently and what they are capable of doing under adult guidance or capable peers (Vygotsky, 1978).
3. Teaching should enable students to fill the gaps and extrapolate information and materials presented by the teacher. The goal should be to empower learners with skills to be independent, and access use relevant information from various sources to answer their problems and challenges
4. Teaching should involve students working in small groups dialoging and arguing to find solutions to the learning activities. This attribute of cooperative learning support all forms and approaches of constructivism and essential in social constructivism

Principle #1 deals more with the content knowledge the teacher possess for a particular subject in the classroom. This principle is regarded as CK in the theoretical framework of PCK. Principles #1, 2, and 3 form PK in the PCK framework. This paper reports on the content knowledge (CK) and principle of constructivism demonstrated by teachers in the teaching of technology. The paper also assesses the ability/inability of teachers of technology to demonstrate the use of appropriate constructivist teaching methods which also reflect PK in the PCK framework.

2.14 Pedagogical Content Knowledge and the Development of Material and Resources for Teaching Physical Education

Teaching is an art which aids the transmission of information, ideas, values and concepts to learners to cause positive changes in their behavioural pattern. In teaching

curricular and resources are organized with the aim of promoting learning. Effective learning has to be backed by a variety of learning materials referred to in literature on pedagogy as either teaching aids or instructional resources.

The instructional resources are highlighted by literature as books, video/audio and visual aids that are either printed or graphic in nature. Instructional resources are key as they attend to various learners' needs. They provide learners with skills of critical thinking, problem solving, creativity, memorization as well as stimulate learning in a fun and inclusive manner. Instructional resources equally influence the content and process of learning (Ashaver and Mwuese, 2013). They stimulate learners' attitude, performance, attention, comprehension, aid in the visualization of phenomena and enable learners to learn facts as well as analyse and interpret them.

There are varies mechanisms through which instructional resources are used. Ibemene (2000) points out resources could be used for demonstrating, locating, comparing, analyzing and emphasizing phenomena or a skill. Without instructional resources, physical education are learnt in an abstract manner, leaving learners with only imaginations about the learned skill or phenomena. Teachers' professional knowledge with regard to instructional resources selection and use has to be emphasized. This leads to practice change in the classroom and the planning of physical education experiences. Teachers need to be supported in order to develop expertise in creating appropriate instructional resources using low costs as well as obtaining them from locally available materials.

Several challenges have been noted with regard to selection and use of instructional resources. For example Sarkar (2016) points out quality of instructional resources as well as methods used and the quality of teachers and playing significant role in the

successful deployment of teaching and learning resources. The quality of teaching and learning physical education depends on the availability and adequacy of instructional resources. Physical education demands the use of specially designed resources which can be manipulated to support the acquisition of motor skills as well as the manipulation of various parts of the body for desired ends. The teaching and learning of physical education therefore demands appropriate selection and use of instructional resources which calls for skillful application of knowledge. Learners' performance and attitude in physical education greatly depends on the choice of resources for teaching and learning.

The availability of instructional resources makes teaching and learning easier and enjoyable. It also motivates the teacher. Classroom interaction could consequently be designed by the relationship and interactions between teachers, learners, instructional materials and the environment. These form part of the school climate. Supply of resources impacts on the quality of teaching and education generally. Pedagogical content knowledge is critical in material development. Essentially, pedagogical content knowledge is a form of craft knowledge that combines content and pedagogy and one of the contexts in which it is manifested is in the development of relevant and appropriate instructional material for teaching. Choosing relevant resources is a part of a teacher's daily work. Pedagogical content knowledge encompasses both the theory learned about the development, selection and use of resources as well as the experiences that are gained cumulatively. The selection and use of relevant materials will be determined by the depth of a teacher's pedagogical content knowledge.

Pedagogical content knowledge illustrates how subject matter of a discipline such as physical education is transformed for communication to learners. Teaching according to current standards, demands that teachers understand subject matter deeply so that

they are able to map out resources that would aid create powerful learning. Being subject specific, pedagogical content knowledge is instrumental in guiding teachers in the choice of subject specific teaching and learning resources.

Physical education in contrast to other subjects in the educational system develops differently. This is because learning is mainly through physical activity and the environment where learning takes place. In addition to the classroom other learning environments such as the field are critical. The challenges and strategies of designing and selecting relevant instructional materials to suit the diverse environments are equally unique. The teacher is therefore expected to adapt knowledge bases according to characteristics and teaching resources demanded.

Granted that the current study sought to analyse data regarding the application of PCK as a manifestation of its development in physical education, a global perspective on the preparation of instructional materials would be fairly critical. Form a curricular point of view instructional resources form part of pedagogy.

2.15 Policy Guidelines on Physical Education

The International Charter for Physical Education and Sport in Article 1.1 states that, "Every human being has a fundamental right of access to physical education and sport, which are essential for the full development of his personality" (UNESCO, 1978). The Quality Physical Education Guidelines for Policy makers further recognize that,

> "Physical education is uniquely positioned to contribute to education in ways that an hoc physical activity, and informal leisure participation cannot, due to its emphasis on developmentally appropriate and carefully sequenced physical activities" (UNESCO 2015).

The World Health Organization (WHO) 2008-2013 Action Plan identified physical activity as the easiest choice in preventing obesity. The ultimate goal of a quality physical education program is to help students gain the knowledge, skills, and attitudes to be physically active for a lifetime (National Association for Sport and Physical Education [NASPE], 2004). School-based physical education has been identified as part of the solution for addressing the childhood obesity epidemic (Payne & Morrow, 2009) and as one of the primary means responsible for promoting the adoption of active lifestyles in children (Sallis & McKenzie, 1991).

In 2003, the United Nations (UN) General Assembly adopted the resolution (58/3): Sport, as means to promote education, health, development and peace and declared 2005, the International Year of Sports and Physical Education (United Nations, 2020). In 2015, the UN General Assembly adopted the 2030 Agenda for Sustainable Development. Building on the principle of 'leaving no one behind', the UN and its member states adopted 17 Sustainable Development Goals (SDGs) to make emphasis on a holistic approach achieving sustainable development for all. P.E and sport can contribute to the achievement of the goals, in particular SDG 3, which emphasizes on healthy lives and promotes well-being for all at all ages.

The Sixth International Conference of Ministers and Senior Officials Responsible for Physical Education and sport (MINEPS VI) in 2017 marked a shift from declarations of policy intent to measurable actions with the adoption of the Kazan Action Plan emphasizing on P.E and sport as enablers of sustainable development and peace. It laid emphasis on MINEPS V (2013) where it was recognized that P.E and sport can bring a variety of individual and societal benefits such as health, social and economic development, youth empowerment, reconciliation and peace. The Kenya Youth

Development Policy, 2019 emphasizes the importance of sport development for promoting better health and wellness among the youth. The policy thus prioritizes and supports direct involvement of youth in physical activity and interventions that target them. This is in tandem with the view that promotion of physically active life is imperative in the early life for the health development of children and youth including those with disabilities and special needs (Republic of Kenya, 2021).

2.16 The Value of Teaching Practicum

Teachers are critical levers in the success of any educational enterprise. This is because they aid bringing about meaningful changes in society. An effective teacher training programme contributes a great deal to the high quality of any education system. Pre-service teachers' training provides several models of professional education. Wallace (1991) outlined the craft model, the applied science model and the reflective model as some of the examples of initial teacher professional development models. Despite relatively minor variations between the models they share teaching practice as a common element in teacher preparation. There are many ways of organizing teaching practice. One of these is the practicum which provides pre-service teachers with practical experience of how the real teaching job goes on (Gan, 2013). The practicum plays a major role in helping student teachers bridge the theory and practice gap and develop their personal teaching competence.

Some teacher training institutes have adopted apprenticeship as an integral part in teacher preparation. All training institutions emphasize the essentiality of teaching practicum as an opportunity for teacher trainees to be involved with and participate in all aspects of schools' activities. Through the experiences they learn to link theory and

practice and acquire the understanding and skills necessary for effectively teaching in a range of classroom situations.

Gower Phillips and Walters (2005) identify four areas that teaching practice focuses on. These are sensitivity to learners' problems in the given subject area, sensitivity to how learners learn along with the strategies they employ and the problems therein, classroom management skills and teaching techniques. During teaching practice which takes a specific block of time, the trainees experience the art of teaching. They are assigned to a mentoring teacher and specific classes. The teacher trainees are observed and guided by supervisors. Notably, the practicum is carried out in another school away from the training institution, where a mentoring teacher guides the trainees. The teaching is done on specific group of learners in real context. A team from the training institution helps trainees as they take up their practicum.

On the whole the practicum framework displays five main features. These are:

- The integration of the practicum into the training programme;
- Emphasis of team approach to delivery. The team includes teacher mentors, supervisors, the tutor assessors and the trainees;
- The programme provides intensive modeling and coaching
- The incorporation of intensive systematic observation
- Assessment modes which take varied forms depending on the philosophy of the training institution.

Numerous studies have considered the practicum as a chance by trainees to put their theoretical knowledge into practice. It is through the practicum that trainees experience real teaching where they try out techniques, practice with assessment and are exposed to real learners, their challenges and the factors which influence learning

(Gowers *et al*., 2005). Yan and He (2009) argue that trainees are able to develop self control and inter-personal sensitivity which are important traits that the trainees would encounter in their professional life once they become teachers. Furthermore, being placed in a teaching practicum to try the daily tasks that a real teacher has to undertake, trainees learn and practice independent problem solving skills, co-working with fellow staff and developing professional values and attitudes. Based on how the trainees perform, they could confirm that they have chosen the right career. Upon completion the trainees gain professional knowledge about workplace behavior and feel better prepared to enter the workforce and or pursue further studies.

The teaching practice exercise is the culminating point where the relationship among the three major players: university supervisor, host teacher, and aspiring teacher interface to determine the quality of experience the aspiring teaching will take away. It becomes the bedrock on which the aspiring teacher once certified and employed builds his/her professional identity. It is therefore, necessary that aspiring teachers are paired with competent, knowledgeable and concerned university supervisors to help them assume the full range of duties of a teacher during this hands-on training period. Host teachers have equally vital influence in aspiring teachers' professional growth and development. This paper outlines the rudimentary elements involved in designing teaching practice field exercise for the student teachers.

Good teaching practice is a key influence on student learning - a desired outcome and primary goal of higher educational institutions. Teachers strive to meet the principles of good practice in an effort to provide the best learning experience for their students - Student Teaching is the most important experience in teacher education programme and is generally based on a country's National Education policy. Teaching practice is a compulsory course for all aspiring student teachers registered in a teacher

preparation programme in Kenya. It is one-semester in duration; during which period trainees undertake instructional planning, teaching, resource preparation and actual teaching.

The teaching practicum at any higher institution is a well-structured programme designed to provide an opportunity to develop and evaluate aspiring teachers' competence in an actual classroom within school settings. In a paper on Global exposure presented at the Research Seminar Series, Aglazor (2011) noted that field-based experiences such as study abroad and student teaching are intended to bridge theory and practice. The teaching practice exercise is the culminating point where the relationship among the three major players: university supervisor, host teacher, and aspiring teacher interface to determine the quality of experience the aspiring teaching will take away. It becomes the bedrock on which the aspiring teacher once certified and employed builds their professional identity. It is therefore, necessary that aspiring teachers are paired with competent, knowledgeable and concerned university supervisors to help them assume the full range of duties of a teacher during this hands-on training period. Host teachers have equally vital influence in aspiring teachers' professional growth and development.

A College of Education or University Faculty of Education Teacher Education Programme is informed by its institution's unique vision and mission. For validity, education programmers' must be guided by their institution's vision and philosophical theories.

This underscores the reason why programmers must make sure their student teachers understand both the institution and programme's educational philosophy.

2.17 General Considerations

Teaching any subject is a highly complex cognitive activity in which the teacher must apply knowledge from multiple domains. Teachers with differentiated and integrated knowledge may have a greater ability than those whose knowledge is limited and fragmented. The process of teaching involves planning, implementation, evaluation, and feedbacks. It requires thorough planning to produce effective teaching which will consequently lead to effective learning in the classroom. In any profession, there is a specialized professional knowledge that makes it unique and distinct with striking features entirely different from other professions. One of the characteristics of good teachers is that they possess a substantial amount of specialized knowledge for teachers known as pedagogical content knowledge. Pedagogy has been the focus of most teaching researches between the 1960s and 1980s; which consists of general knowledge, beliefs, and skills related to teaching. It includes knowledge of the principle of instruction, and knowledge and skills related to classroom management (Jacob, John, & Gwany, 2020).

Shulman (1987) identified seven domains of teacher knowledge, one of which is PCK. Among those categories, PCK is of special interest because it identifies the distinctive bodies of knowledge for teaching. It represents the blending of content and pedagogy into an understanding of how particular topics, problems, or issues are organized, represented and adapted to the diverse interests and abilities of learners, and presented for instruction. PCK is the category most likely to distinguish the understanding of the content specialist from that of the pedagogue.

According to Grossman (1990) there are four components of pedagogical content knowledge: knowledge and beliefs about the purpose of teaching a subject at different

grade levels; knowledge of learners' understanding of the subject matter; knowledge of the curriculum and materials available for teaching a subject and knowledge of instructional strategies and representations for teaching particular topics. These are fundamental components of an instructional process that assure effective delivery of content for maximum acquisition of the intended knowledge, skills, values and attitudes.

Shulman (1986; 1987) argues that there is a distinct form of teacher's professional knowledge – Pedagogical Content Knowledge, different from teacher's subject matter knowledge or knowledge of general principles of pedagogy. In Shulman's view, Pedagogical Content Knowledge is a form of practical knowledge used by teachers to guide their actions in a contextual classroom setting. Pedagogical Content Knowledge, therefore, builds on other forms of professional knowledge and is then a paramount constitutive element in the knowledge base of teaching. No study has, however been undertaken on Pedagogical Content Knowledge to determine the relation if any, between PCK and pupil's outcomes in Physical Education. This study seeks to the influence of student teacher's physical education pedagogical content knowledge on achievement of learning outcomes in primary teacher education with a view to proffering suggestions for improvement.

Shulman claimed that PCK is a distinct body of knowledge even though knowledge of content and knowledge of pedagogy contribute to it. He also noted that PCK includes knowledge of learners, knowledge of educational context, and knowledge of instructional materials. Tamir (1988), however, made a sharper distinction between general pedagogical knowledge and subject-matter-specific pedagogical knowledge. He claimed that each type of knowledge is composed of four categories-namely,

student, curriculum, instruction, and evaluation- but they have different meanings in each domain. He provided examples for each category to reveal the distinction between general pedagogical knowledge and subject-matter specific pedagogical knowledge. For instance, for the student category, knowing about Piaget's developmental levels is related to general pedagogical knowledge, whereas knowing about specific common conceptions and misconceptions in a given topic is related to subject-matter specific pedagogical knowledge. Furthermore, he identified teachers' skills in diagnosing students' conceptual difficulties in a given topic and their knowledge about effective use of instructional tools as subject-matter-specific pedagogical knowledge.

Based on his study with elementary teachers Marks (1990) suggested three different derivations for PCK. First, PCK is rooted in subject-matter knowledge. The transition from subject-matter knowledge to PCK is achieved through transforming a particular piece of content to make it comprehensible for specific learners. Second, PCK is primarily derived from general pedagogical knowledge, which pre-service teachers acquire from courses where they learn about students' learning processes and teaching strategies. However, teachers have to apply those ideas to particular content and particular students when they are teaching. Third, PCK is derived from the combination of subject-matter knowledge and general pedagogical knowledge or from previous construction of PCK. Teachers make decisions about what learning activities and teaching strategies to use when teaching a particular topic by depending on their previous experiences with teaching that topic.

According to Shulman (1986) initial definition of PCK should include knowledge about misconceptions, knowledge about curriculum and knowledge about difficulties.

Therefore, in order to investigate teachers' PCK and its impact, it is necessary to identify which aspects of instruction will most likely be affected by the teachers' PCK.

Knowledge about misconceptions:

A misconception is a scientifically incorrect conception that stems from learners' everyday experiences. Knowledge about misconceptions should enable the teacher to identify particular misconceptions of students in the classroom and to be able to teach for conceptual change (Duit, 2000). Adequately knowledgeable teachers have the ability to identify misconceptions of their students during instruction. Once a students' misconception is recognized, the teacher may react to it, for example, by giving feedback to the student in one way or another.

Knowledge about curriculum:

Knowledge about curriculum is significant because it is indispensable for a teacher to choose topics from the curriculum and prepare them in a way appropriate to students' level of understanding. Shulman (1986b) describes curriculum knowledge as the "tools of the trade" of teachers. It is knowledge of the whole curriculum in its widest sense, the plan of study, and the kinds of materials used to teach each subject. A teacher should familiarize with a curriculum used previously as well as possible curriculum changes in the future. Sound knowledge about curriculum should lead to a carefully designed content structure. When planning instruction, teachers choose content, analyze this content with respect to what the central aspects of the content are and design artifacts that will provide learning opportunities for their students with respect to the aspects of the content they are expected to learn (Kattmann, Duit, Gropengießer, & Komorek, 1997).

Knowledge about difficulties:

This relates to teachers' ability to differentiate between content easy to learn and more difficult content. The teacher hereby links the recognition of knowledge acquired by the students, teacher's awareness of students' conceptualizations, any prior knowledge acquired including that of the students' difficulties. The teachers have the ability to cognitively activate the students by designing learning opportunities Cognitive activation elements can be implemented by the assignment of tasks (Kunter et al., 2005).

PCK integrates the teacher's knowledge of the purpose of teaching, knowledge of students understanding of the subject matter and the instructional strategies and materials for teaching specific topics (Grossman, 1990). Various studies have brought out highlights in teacher's PCK in execution of activities. Thus, the use of the construct PCK in PE seeks to provide a deeper understanding of teacher behavior and students learning experiences. Hastie and Vlaisavljevic (1999) in observing teacher's behavior and instructional practices during PE classes noted that teachers with high PCK displayed strong subject matter expertise, thus emphasizing the significance of PCK as a critical component for effective instruction. Further, noting that PCK is an important factor in the development of effective PE teachers, Wirgand, Bulger and Mohr (2004) posit that:

> "the acquisition of PCK represents the instructional backbone of physical educators professional preparation." (p.52).

Additionally, Gusthardt and Sprigings (1989), in their study utilizing video-taped lessons and a systematic observation instrument targeting teacher dialogue, selection of tasks, demonstration and student attainment of outcomes concluded that the effective and expert teachers are those with high PCK. They are able to communicate

clearly, guide learners through the selected tasks and give sufficient instructions for appropriate skills practice. Nevertheless, the recommended the need to also consider the teaching environment.

A study on policy review in seven countries; Australia, Japan, Korea, the Netherlands, Norway, the United States and Wales (United Kingdom, OECD, 2019) and acknowledged that while evidence on teacher education is growing, it is still ‘far from being clear-out and conclusive. In the Teacher Education Pathway Model by Roberts-Hull, Jensen and Cooper (2015), it is recognized that Initial Teacher Preparation “encompasses pre-service education and preparation during the first years of teaching.”

Student performance is a critical aspect of the learning process and a known predictor of learning and success in physical education (Rink, 2010; Silverman, 1985; Silverman, Subramaniam, & 427 Woods, 1998). A study was conducted whose aim was to investigate the effect of professional development, in the form of a content knowledge workshop, on the quality of instruction and student learning. The findings noted that most students rarely performed the skills correctly in the comparison classes, whereas the students tended to perform the skills correctly in the experimental classes. Both teachers used more correct task representations and more mature tasks by using more diverse forms of visual and verbal representations in teaching after the badminton content knowledge workshop. The results of this study indicate that a relatively short, 4-hour content knowledge workshop was effective in changing teacher pedagogical content knowledge (PCK) behaviors. More importantly, the results also demonstrate that these changes in teacher PCK behaviors produced better student learning and performance.

A study to evaluate the health related levels of secondary school students in Kenya revealed that participation in school-based PE programmes was beneficial to learners. The study sample comprised of 100 subjects aged between 14-17 years. The experimental group consisted of 25 boys and 25 girls who were exposed to three lessons of PE per week for a period of ten weeks. The control group consisting of 25 boys and 25 girls did not participate in PE lessons. The subjects were finally compared in fitness levels of the following components: cardiovascular endurance, abdominal muscular endurance, trunk flexion and the sum of skin fold. The findings indicated that participants in the PE programme performed better in cardiovascular endurance, abdominal muscular endurance and trunk flexion than those who did not participate in the PE programme (Esmail, 1983). While this study shows the impact of PE on learner's performance it is different from the current study in the design used as well as the focus of the variables. This study seeks to link pre-service teacher's pedagogical content knowledge to the ability of learners to execute sports skills thus adding a different dimension of knowledge on PE.

A study conducted at Michigan State University (Schram, Wilcox, Lanier, & Lappan, 1988) aimed to investigate the nature and the extent of the changes in preservice elementary teachers' beliefs and knowledge about mathematics and teaching and learning mathematics as a result of a series of innovative mathematics content courses, a mathematics methods course and a curriculum seminar. The preserves teachers took three content courses that were specifically oriented to exploring ideas about numbers, geometry, probability, and statistics as well as the relationships between them. The instructor attempted to create a learning environment for preservice teachers in which they could work in groups to explore ideas, discuss the

solutions to the problems, generate different representations, and make connections among mathematical ideas.

Schram et al. noted that at the end of the courses, the preservice teachers' views about mathematics had changed; initially they thought that mathematics was a meaningless series of symbols and rules, but by the end of the courses they appreciated the value of conceptual understanding of mathematics. Furthermore, they liked the way the instructor set up the learning environment. However, they were unable to transfer what they experienced in the courses to their own instruction. Some of them still held their traditional view of mathematics and emphasized procedural knowledge rather than conceptual understanding when teaching mathematical facts and procedures. The current study seeks to establish whether the teacher CK and PCK influence the learner's ability to perform. While it does not provide the room to remedy the challenges that the pre-service teacher encounters in teaching, it is hoped it will provide a basis for improving the way PE is taught to pre-service teachers so that they can better acquire the needed competences.

Seidentop (1991) and Rink (2010) described physical education pedagogy as the adaptation of content to learners needs as a representation of PCK, drawing on Doyle's (1981) task system theory and content development framework respectively. Siedentop (1991) described development of an instructional task as a function of what the teacher accepts as learner performance. Thus, the teacher states the task, the learner may respond by performing the task as stated or modifying the task, making it easier or more difficult to perform depending on their ability. The teacher's response may be as follows: - a) ignore (whether intentional or unintentionally; b) accept by

praising; and c) modify the task by making it easier. Adaptation in Siedentop's (1991) model occurs when the teacher modifies the task to an individual or a small group.

As Plato espouses, "lack of activity destroys the good condition of every human being, while movement and methodical physical exercise preserve it". When children are between the ages of five (5) to twelve (12) years, they need to be guided to develop physical, social, emotional and cognitive skills necessary to lead a healthy active lifestyle (Gaber, Locke, Lambdin and Solomom, 2008). Schools can provide many opportunities for learners to engage in various physical activities and are thus better placed amongst societal institutions to motivate children to lead active lifestyles (Jenkinson & Benson, 2010).

Fletcher (2011) reveals positive and statistically significant change in student teachers' identities as teachers of Health and Physical Education (HPE) after being provided with some basic strategies for teaching elementary HPE and teaching practice experience to either observe or to try teaching HPE**.** Several studies have been carried out in Kenya relating to evaluation of the implementation of PE programs in Kenya Primary Teachers Training Colleges (Kiganjo, 1987) and Kenya Diploma Teachers Training Colleges (Muniu, 1986). Gitonga, Andanje, Wanderi and Bailasha (2012), conducted a study on the attitudes of teacher trainees towards physical education in Kenya which revealed that the teacher trainees had a positive attitude towards physical education. However, none of these studies, make reference to the teacher trainees' acquisition of subject matter content and Pedagogical Content Knowledge. Thus, it may be assumed that a teacher's use of a general set of pedagogical practices for instruction will be effective regardless of the academic subject being taught. This study seeks to emphasise that Physical Education has

pedagogical practices which should be understood and utilized if learners are to be effectively supported to achieve their potential in physical activity.

2.18 Summary

In this chapter literature on PCK in relation to aspects that touch on the study has been reviewed. This was done in line with the objectives of the study which provided the main themes of the review. The review provided the platform against which data would be analysed and interpreted. In the subsequent chapter information related to research method of the study was undertaken.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology in the context of this study refers to the specific procedures that were used to integrate the different components of the study in a coherent and logical way, thereby, ensuring that the research problem is addressed effectively. This chapter presents the philosophical underpinnings of the study, research design that was adopted, target population, sampling procedures and sample size, data collection techniques, validity and reliability, trustworthiness of the study, ethical considerations, data collection and data analysis procedures.

3.2 Research Design

The current study adopted a definition of research design that envisaged the concept as the entire research process (Creswell, 2009). The process encompasses a number of key aspects including the philosophical paradigm, the approach, method, sampling procedure as well as data generation procedure among others. In discussion these aspects emphasis is placed on relationship between them. The study was a relativist – interpretivist mixed method study. The subsequent sub-section explains the first aspect of the design, the philosophical underpinning of the study.

3.3 Philosophical Underpinnings of the Study

The concept of "paradigm" originating from the Greek language, was first used to mean a philosophical way of thinking (Kuhn, 1962). Willis (2007) explains that: "A paradigm is thus a comprehensive belief system, world view, or framework that guides research and practice in a field" (p.8). It refers to the sets of abstract views about knowledge and the process of creating that knowledge, which provide a

foundation for the entire design and what the researcher makes of the findings (Denzin and Lincoln, 2005; Lichtman, 2014).

According to Kivunja and Kuyini (2017), there has been variation in the way the term "paradigm" is employed in various daily and research discourses. It is, however, accepted that any research paradigm has four integral qualities namely: - epistemology, ontology, axiology and methodology, with different and sometimes similar explanations (Creswell, 2007; Johnson, 2011). A paradigm, thus, has significant implications for every decision made in the research process, including choice of approach, research design and methodology, and how meaning is constructed from the data the researcher collects (Willis, 2007).

The main research paradigms that influence the methodological choices of researchers are the realism-positivism/post-positivism, the relativism- interpretivism/constructivism, and the pragmatism (Richards, 2003; Jwan and Ong'ondo, 2011).

The positivism world view, a 'scientific' research paradigm striving to investigate, confirm and predict patterns of behavior, is commonly used to test theories or hypotheses. It is useful in natural science, physical science and sometimes, in the social sciences, focusing on the objectivity of the research process (Creswell, 2008). The paradigm which uses quantitative methodology, employs experimental methods involving treatment and control groups, and administration of pre-tests and post-tests to measure gain scores.

The Post-positivism paradigm is the modified scientific method for the social sciences. Post-positivism posits that it is not always possible to provide explanations of a causal nature. It acknowledges the influence of the researcher's theories, background, knowledge and values on what is observed. (Creswell, 2008; Ghiara,

2019; Kivunja & Kuyini, 2017; Taylor & Medina, 2013). It is employed in quasi-experimental research allowing more interaction between the researcher and his/her research participants (Willis, 2007). It uses additional quantitative and qualitative methods and participant-observation (Creswell, 2008), to produce objective and generalizable knowledge about social patterns.

The relativism-interpretivism/constructivism perspective used in qualitative research holds that there always exist multiple viewpoints on any Social Science related subject under inquiry. It relies on the participant's views of the situation being studied, thus, leaning more towards finding out the complexity of views rather than narrowing meanings into a few categories or ideas (Johnson, 2008). This paradigm posits further that knowledge is socially constructed, so "the focus of research is on an understanding of this construction and the multiple perspectives it implies… An understanding of this develops interpretively as research proceeds" (Richards, 2003:38).

Relativism-interpretivism/Constructivism highlights the importance of the researcher's own subjectivity in the (hermeneutic) process of interpretation, and emphasizes its progressive development as a key part of the inquiry process. thereby adding to the emergent and reflective quality of interpretive research (Taylor & Settelmaier, 2003). The research methods utilized include ethnography, action research, grounded theory, phenomenology, case study, hermeneutics and discourse analysis (Guba & Lincoln, 2005).

The pragmatist paradigm holds the view that research is guided by the value for the knowledge being sought and not the distinctive worldviews about the world as being real or relative. It orients itself toward solving practical problems in the ''real world''

(Creswell & Plano Clark, 2007, pp. 20-28). Johnson and Christensen (2020) describe pragmatism to be the philosophical position that what works in particular situations is what is important and justified or "valid". Pragmatism embraces multiple perspectives and multiple forms of data. This expanded version of pragmatism also referred to as "dialectical pluralism" (Johnson, 2017), is the one this study is inclined to.

Morgan (2007) and Patton (1990) in Creswell (2009), convey the importance of pragmatism for focusing attention on the research problem and then using pluralistic approaches to derive knowledge about the problem. Pragmatism is, therefore, seen as the paradigm that provides the underlying philosophical framework for mixed-methods research (Tashakkori & Teddlie, 2003; Somekh & Lewin, 2005). Consequently, research draws from both paradigms as long as this is necessary to get a complete understanding of the subject under investigation (Hammersley, 2013; Onwegbuzie, 2012; Schwandt, 2015).

This study on influence of student teacher's Physical Education Pedagogical Content Knowledge on learner's achievement during Primary Teacher Education practicum, adopted the pragmatist research paradigm due to its pluralistic and real-world practice orientation (Creswell and Creswell, 2018). It was designed and conducted based on what would best answer the research questions with the intention of resulting in pragmatic knowledge. The study was hinged on the assumptions that underpin the pragmatic paradigm as adapted from Kivunja & Kuyini (2017, pp. 30-36): - non-singular reality (ontology), relational perspective (epistemology), value laden inclination (axiology) and mixed methods (methodology).

3.3.1 Ontology

Ontology refers to the nature of reality or knowledge. It is a branch of philosophy which deals with the nature of existence. By extension it refers to the assumptions which subjects have about reality and knowledge. The assumptions are either objective or subjective. An objective reality views the world as a tangible and hard reality made up of relatively immutable structures that exist independently of our individual descriptions. This means that the social world is real and external to the individual. On the other hand a subjection view of the world which is relativist in orientation, views knowledge as constructed in the names, labels and concepts that are used to structure reality. Since the social world is created by individuals, multiple realities exist. Since human beings believe that they exercise free-will and make judgements which alter the course of their lives, a lot of attention is paid to the details of people's inner mental states. This study was conducted within a relativist and subjective position. Knowledge about teaching Physical Education by teacher trainees during the practicum was constructed as the trainees interacted with their learners' colleagues who included regular teachers and their trainers. These groups had the capacity of creating different realities making relativism relevant.

3.3.2 Epistemology

According to Denzin and Lincon (2005), epistemology refers to the nature of knowing and construction of knowledge. The researcher adopted a constructivist view of perceiving reality. The constructivists believe that the knower and the known are interdependent. This means that social science is essentially subjective. Consequently, the social world can only be understood by occupying the frame of reference of the participant in action.

Related to epistemology are axiological assumptions. Axiological assumptions relate to values. The critical question axiologically posed is whether values can be suspended in order to understand or do value mediate and shape what is understood? As a researcher, I take the position that values do mediate and shape what is to be understood. Values related to knowledge and the competence of teacher trainees was critical in determining how they succeeded in their classroom instruction. A distinction is made between nomothetic and ideographic approaches in interpreting the assumptions made about values. Nomothetic approaches focus on an examination of regularities and relationships whereas ideographic approaches on reasons as to why subjects create and interpret their world in a particular way. The current study was ideographic since the researcher believed that the phenomenon being studied could only be understood by obtaining firsthand knowledge of what trainees did during P.E. lessons. This was achieved by one on one interaction with the participants in the field.

3.4 Research Design

A Research design is the framework of research methods and techniques chosen by a researcher to conduct a study. The beliefs held by individual researchers will often lead to embracing qualitative, quantitative or mixed methods approach. This study adopted a mixed methods approach and employed a cross-sectional survey design which enabled the collection of data at one point in time (Creswell and Creswell, 2018). As Creswell (2009) posits, it is more manageable to collect both quantitative and qualitative data at roughly the same time, rather than to revisit the field multiple times for data collection (p.206). The researcher found this conducive since the practicum for student teachers is conducted at specific periods within the training schedule.

According to Creswell, 2009, within the mixed methods approach there are broadly two research designs – Sequential or Concurrent in which the weighting of the Quantitative and Qualitative approaches may vary. In the concurrent design, both qualitative and quantitative data is collected concurrently but two scenarios may occur in reference to the weighting of either data. First, equal weighting in which there is a comparison of the two data bases (qualitative and quantitative) to determine whether there is convergence, differences or a combination in information. Second, varied weighting in which either quantitative or the qualitative data may be identified as the primary or secondary method that will guide and/or provide a supporting role.

The survey design provided the opportunity to use both quantitative and qualitative methods. The quantitative research approach sought to quantify responses by generating numerical data. Qualitative research on the other hand explored perspectives, attitudes, behaviors and experiences from the respondent (Dawson, 2009). Data was generated using non – structured or semi structured instruments that allowed for interaction of the researcher(s) and the respondents in a flexible manner that could generate in-depth data from purposively sampled participants in a naturalistic setting (Denzin and Lincoln, 2005; Lichtman, 2013; Yin, 2014; Jwan and Ong'ondo, 2011).

In this study, the concurrent mixed methods approach design was used where both the quantitative and qualitative data phases took place at the same time and they were weighted equally. Thus, the mixed methods approach and the cross-sectional survey design were mutually complimentary and provided for triangulation as illustrated in Figure 3.1.

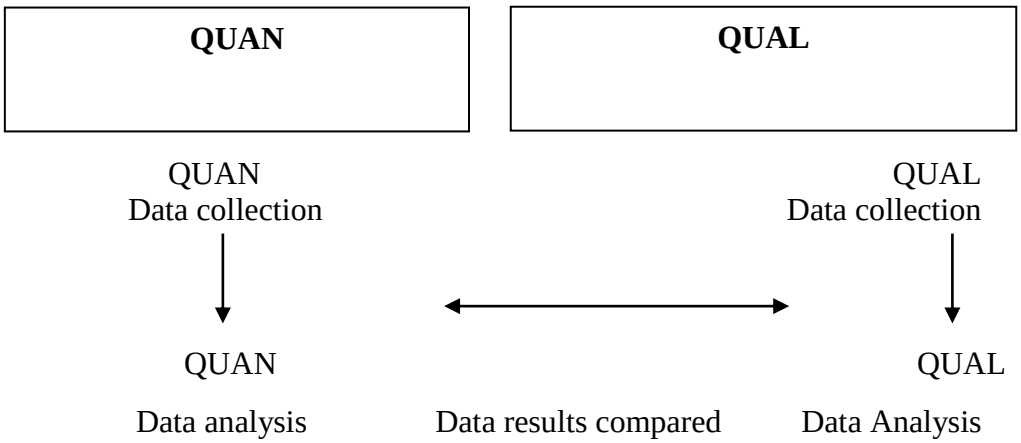

Figure 3.1: Concurrent Mixed methods design

Source: Adopted from Creswell (2009)

Mugenda (2008) posits that whereas cross-sectional studies cannot be conducted to determine cause and effect between variables, they can help the researcher to establish whether significant associations among variables exist at some point in time (p.71). The survey design was deemed appropriate as the variables were neither manipulated nor arranged for the events that followed, but allowed for triangulation of the qualitative and quantitative data gathered. The study involved a systematic collection and analysis of data in order to assess the influence of student teacher's Physical Education Pedagogical Content Knowledge on learner's achievement during Primary Teacher Education practicum.

3.5 The Study Site

The study was carried out among Primary Teachers' Training Colleges that fell within what the researcher loosely defined as Western Kenya. Prior to the enactment of the 2010 constitution this region was predominantly made of two provinces namely Western and Nyanza. In this study the two regions were categorized as sub-regions. For ethical purposes the region sub-regions were named sub-region 1 and 2

respectively. Each sub-region had both public and private TTCs. These were pseudo-hymned in order to hide their identity for ethical purposes. The public TTCs were given codes and numbers initiated with PTTC and a numeral given whereas the private TTCs were initiated with PTETC with numerals. In total 18 primary Teachers Training Colleges were sampled for the study. This is shown on the following table. Since Teacher Training Colleges are subjected to similar training the choice of the colleges was feasible hence the study could be replicated in any other region.

Table 3. 1: Codes for Participating Institutions

SUB-REGION 1		
PTTC 1	140	42
PTC 2	117	35
PTC 3	160	48
PTC 4	157	47
PTC 5	113	34
PTETC 1	80	24
PTETC 2	67	20
PTETC 3	157	47
PTETC 4	110	33
PTETC 5	47	14
PTETC 6	40	12
SUB-REGION 2		
PTC 1	137	14
PTETC 1	110	33
PTETC 2	33	10
PTETC 3	23	7
PTETC 4	33	10
PTETC 5	37	11
PTETC 6	50	15
	1610	483

3.6 Target Population

The target population referred to all the individuals, objects or things that the research could reasonably generalize its findings to (Mugenda, 2009). The target population for this study was 1610 second year pre-service students who had undertaken their first and second teaching practice and lecturers of Physical Education in the eighteen

(18) colleges in the western region of Kenya. Amongst the targeted colleges there were (6) public and nine (12) private Primary Teacher Training Colleges (PTTCs). The second year trainees had undertaken several teaching practice sessions were therefore competent enough to respond to the research items.

3.7 Sampling Procedures and Sample Size

The sampling process for this study sought to select the actual data sources from a larger set of possibilities. The focus was on choosing people and research sites that could best provide required information, by putting in place a sampling procedure that determined the number of people that were needed to provide the data. Morgan, 2008, defines the population as the full set of possible data sources while the sample is the selected specific data sources from that population. The population for this study was the second year student teachers in the Primary Teacher's Training colleges.

The study adopted purposive sampling to select the sites, public and private PTTCs, and the lecturers of physical education in the colleges to gather the qualitative data. For collection of quantitative data, the study adopted stratified random sampling in the selection of the student teachers based on the homogenous stratums of male and female (Cohen, Manion and Morrison, 2018). In quantitative approach, the intent of sampling was to choose individuals that were representative of the population so that the results could be generalized to the population. The random stratified sampling thus provided a useful blend of randomization and categorization, thereby facilitating the undertaking of the quantitative and qualitative components of the research study.

The target population of the second year student teachers in the selected Primary Teacher's Training colleges was 1610 (MOE, 2015/16). The determination of the minimum sample size was done using Cochran (1977) formula as indicated below:

$$n = \frac{N}{1 + Ne^2}$$

$$n = \frac{1610}{1 + 1610(0.05)^2}$$

$$n = \frac{1610}{1 + 4.025}$$

$$n = 320$$

The study employed the current survey design with understanding that the participation of respondents would be voluntary. It was anticipated that the responses may be well below 100%. Salkind (1997) recommended that "If you are mailing out surveys or questionnaires, . . . count on increasing your sample size by 40%-50% to account for lost mail and uncooperative subjects" (p. 107). In this regard a higher sample was calculated

Where anticipated return rate = 65%.

Where n2 = sample size adjusted for response rate.

Where minimum sample size (corrected) = 320.

Therefore, n2 = 320/.65 = 496.

The adjusted sample size was 496. The anticipation of the 65% response rate was based on the results of the pilot of instruments that had been undertaken during the preparation for the study.

According to Mugenda and Mugenda (2013), when a study population is less than 10,000, a sample between 10%-30% is a good representation of the target population. In this study, having established the minimum sample size and the adjusted sample size, responses were received from 30% of the targeted population accounting for 483 responses. The total sample was within the minimum and adjusted sample size as calculated. The sample frame is thus presented in Table 3.2.

Table 3. 2: Sampling Frame and Codes for colleges

SUB-REGION 1

	Institution	Population	No. of respondents
1.	PTC 1	140	42
2.	PTC 2	117	35
3.	PTC 3	160	48
4.	PTC 4	157	47
5.	PTC 5	113	34
6.	PTETC 1	80	24
7.	PTETC 2	67	20
8.	PTETC 3	157	47
9.	PTETC 4	110	33
10.	PTETC 5	47	14
11.	PTETC 6	40	12
	SUB-REGION 2		
	PTC 1	137	14
	PTETC 1	110	33
	PTETC 2	33	10
	PTETC 3	23	7
	PTETC 4	33	10
	PTETC 5	37	11
	PTETC 6	50	15
	TOTAL	**1610**	**483**

KEY
PTC - Public Teacher Training College
PTETC - Private Teacher Training College

3.8 Data Collection Instruments

The study employing the concurrent survey design used a combination of research instruments in order to answer to the objectives of the study. Standardized (usually structured) instruments were used to generate numerical data from participants who were representative of the target population. Data was collected using questionnaires, an interview guide, a checklist and lesson observation guide. Data was collected concurrently to enable triangulation of the responses elicited through the different instruments.

3.8.1 The Questionnaire

Questionnaires are one of the primary sources of data collection. Richard and Schmidt (2002) advise that while designing a questionnaire a researcher should ensure that the items are valid, reliable and unambiguous. Structurally, there are three types of questionnaires namely: closed ended or structured questionnaires, open ended or unstructured questionnaires and a mixture of both open and closed ended questionnaires. Due to the advantages and disadvantages of both closed-ended and open-ended questionnaires, researchers have adopted the use of questionnaires that have both open and closed-ended items. Consequently, this study used both open and closed-ended questionnaires. These were administered on the sampled teacher trainees. The questionnaire items included items that sought to provide data for objective 1, objective 2 and objective 4. The questionnaire enabled the researcher to collect data from the large number of respondents who had been sampled. Its use also enhanced the anonymity not only of the participants but of their institutions as well. This was a critical ethical issue that the researcher sought to observe.

The questionnaire was personally administered by the researcher on the day data was collected from individual participants before they were observed in their classes. The use of the tool was thus time efficient. The physical administration of the question ensured that all were returned. My presence within the institution when the questionnaires were being administered provided the participants with the tool to seek clarification on any aspect of the tool which may not have been clear to them.

3.8.2 Interviews

Interviews are a popular and widely used means of data collection. They enable a researcher to collect first-hand information directly from the research participants. During the process on interviewing a researcher tends to obtain special kind of

information based on what was happening in the respondents' mind. Interviews are therefore key in obtaining information on how respondents perceive and interpret the world around them. Flick (2006) argued that the purpose of an interview is to reveal existing knowledge in a way that can be expressed through answers which are made accessible for interpretation. In this study, the researcher conducted face to face interview with 18 teacher trainers individually. The researcher used an interview guide which ensured that uniform information was sought form the trainers. The interviewer sought to establish the views of the trainers on the adequacy of the content of the Physical Education curriculum in providing trainees with relevant and indepth pedagogical content knowledge and how the trainers rated the trainers perception towards the content of Physical Education. The interview sessions were productive since they allowed me to interrogate and probe responses from the participants. In so doing I was able to collect indepth information and allowed good interpretative validity resulting from well-tested interview protocols.

I was therefore able to establish the thoughts, attitude and the reasons behind these from the perspective of the participants. The interviews were recorded, transcribed and analysed with individual voices of the respondents captured for triangulation with data from other tools. The interview guide approach allowed for the rewarding of specified items based on the needs of the context of the interview. The information collected from different participants who were chosen from different institutions were compared and contrasted thus providing rich views for the research questions. The choice of the trainers as sources of interview information was based on the assumption that they were knowledgeable based on their experience as teacher educators.

3.8.3 Classroom observation

Observation as a data collection procedure involves observing interactions and events as they naturally occur. Used in combination with other data collection tools, observation leads to the collection of relatively objective firsthand information. According to Fraenkel and Wallen (2003), observation is a means of studying subjective factors objectively. Through observation the researcher studies representation of behaviour rather than the behaviour itself. Consequently, the researcher randomly selected one trainee from each of the colleges for observation. Since the researcher was keen on contextual factors that related to PCK, the researcher only watched and recorded events and activities without any involvement. It was also not possible to observe several classes due to the nature of the study and the number of trainees involved. Each participant was only observed once since the researcher was interested on how the selected teaching and learning activities demonstrated the trainees' pedagogical content knowledge. One of the challenges of classroom observation is the problem of reactivity among the participants. The participants may react differently in the presence of the researcher. This was overcome by having a pre-observation session with the participants during which time the participants were made aware of the purpose of the observation and what the researcher would be recording. A checklist was used to record the regularity of given classroom events.

The researcher modified the tool used to observe Physical Education lessons to suit the study purpose. The guide focused on the preparation of professional documents, content mastery, sequencing of content, demonstration of skills and teacher attributes.

Observation has been identified as an important technique in data collection in qualitative studies. Gerring (2007) identifies observation as the most basic element in

any empirical study since it is the foundational base of all research methods in social and behavioural sciences. Observation enabled me to experience at a personal level what the trainees did during physical Education lessons and how they pedagogically handled. This made it possible to compare what was observed with what had been reported in the questionnaires and interviews. Observation is the most direct way of obtaining data. The researcher is able to get what people actually do as opposed to what they say they do. This enables the researcher to develop incontestable description for further analysis and ultimate reporting.

It is important to observe what the trainees did in class in order to determine their pedagogical approaches, teaching methods and content delivery and how they generally handled Physical Education lessons. Borg (2006) argues that observation is critical in determining teacher cognition by providing concrete basis of what teachers know and think that can be examined. Interviews were conducted after class observation. This enabled me to explore the thoughts behind the observed actions.

Several observations were randomly conducted based on random selection of trainees that represented atleast a college. Borg (2006) advises:

> There is no correct figure to aim for in making decisions about the number of observations required in a study. Due to the reactive nature of participants observation data collected over time may be more valid… Remember that decisions about the number of observations to conduct and for how long will be influenced by practical issues such as the availability of time and the availability of the participants (P.246).

We agreed with the trainees on the dates and time of the observation to avoid surprising them. I arrived early enough on the agreed day to engage with the trainees about the lessons to be observed. During the observation I took notes focusing on the content selected; teaching and learning activities, teaching and learning materials, assessment procedures and techniques of content delivery.

My approach fitted into participant- observer mode as well as focused observation. Observer-as-participant observation is brief and formal, whereas focused observation only concentrates on the events relevant to the topic being investigated. Despite the fact that the trainees were tense during observation, I was able to collect the relevant information which gave an insight into the trainees' pedagogical and content knowledge in teaching Physical Education.

3.8.4 Resource Checklist

The resource checklist enabled the study to ascertain the availability, utilization and adequacy of learning resources for teaching PE both at college level for the student teachers and at the classroom level during practicum. The instrument provided information that had implications on determining the adequacy of the content covered in the Primary Physical Education Teacher Education certificate course for preparation of student teachers (objective 1), and to assess the effectiveness of student teacher's observed Physical Education PCK in influencing learner's outcomes during practicum (objective 3).

3.9 Validity and Reliability of Research Instruments

3.9.1 Validity of Research Instruments

Validity refers to the accuracy and meaningfulness of inferences, which are based on the research results (Bryman, 2004). This study focused on content validity which was the measure of the degree to which data collected using the tools represented the specific domain of indicators or content of specific concepts (Mugenda, 2005). The validity of the questionnaires was assured through expert review by professionals in curriculum development and teacher education. The two teams reviewed the instruments to evaluate the concepts the instrument measures and determine whether

the set of items accurately represented the concepts. The tools were then revised according to the experts' suggestions.

The second aspect of validity that the researcher paid attention to was construct validity. This was concerned with the extent to which the measurements accurately assessed theoretical concepts, theme or ideas which were not directly measurable. The researcher provided an indepth description and operationalization of the non-measurable variables into concrete characteristics to provide clear dimensions.

Thirdly, the researcher paid attention to face vailidity of the process. Face validity refers to the degree to which an assessment of subjective variables is attained. The tools were evaluated by experts to ensure all items relevantly set out to answer the research question. During the focus group discussion the researcher had the opportunity to clarify to the respondents any aspect that did not sit well with their understanding.

3.9.2 Reliability of Research Instruments

Reliability is described as the measure of the degree to which a research instrument would yield the same results or data after repeated trials (Mugenda, 2009). In qualitative research, reliability is improved by triangulation, gathering information from multiple sources or by using multiple data gathering tools. In this study, methodological triangulation was used to assure reliability of the qualitative data. Specifically, the *between-method* was adopted for this study as the use of the survey design enabled quantitative data collected from the questionnaires and qualitative data from the questionnaires, observations and interviews (Denzin, 1989).

In this study, the internal consistency technique was used to compute the reliability coefficient of the data from the questionnaires. The extent of consistency was

measured by a reliability coefficient using a scale from 0.00 (very reliable) to 1.00 (perfectly reliable). The reliability of the different items in the questionnaire were established by use of coefficient where the Coefficient alpha which was over 0.8 (Gray, 2012). A high coefficient implied that items in the scale correlated highly among themselves and consistently measured the constructs of interest thus confirming the reliability of the instruments.

3.10 Trustworthiness of the Qualitative Data

Trustworthiness is the degree of certainty that the research process is truthful. This is a critical element in qualitative studies which require a lot of rigour and care in order to qualify to make claims. In qualitative studies credibility, transferability, dependability and conformability are considered critical aspects of the research process. The subsequent section provides details of the above aspects of the study.

3.10.1 Credibility (Internal validity)

Credibility is the extent to which the study investigates and looks into the phenomenon. In this context the researcher was able to PCK in Physical Education of the trainees during the practicum. I sought to investigate the actual happenings during physical Education lessons in order to determine how the trainees demonstrated their pedagogical content knowledge. To achieve this I followed the principles of triangulation in order to access different and detailed perspectives on trainees' pedagogical content knowledge.

Credibility relates to how a study is capable of reporting the actual occurrence in the field. The method chosen should provide data that measure what one wants and provides a valid answer to the research question (Polonsky and Wallar, 2004).

Ong'ondo and Jwan (2020) put fourth four steps through which strategies that ensure reliability and validity of qualitative research.

A valid instrument contains items relevant to the application of trainees PCK. The validity of the items was determined by experts who gauged whether the items clearly sampled out the required skills and traits. Scholars from the other members of the department of Curriculum Instruction and Educational Media played a key role in determining the content validity of the questionnaires, the interview guides, the observation schedule and the resource checklists. Their comments went along way in ensuring credibility of the documents. Furthermore, the use of several data collection techniques (Interviews, questionnaires, observation and resource checklists) made it possible for me to explore different aspects of trainees' PCK in Physical Education. The triangulation of instruments enabled me to have different views of the participants.

Finally, I provided an indepth description of the background and experiences. According to Ong'ondo and Jwan (2011) the use of thick narratives captures the gist of the research and provides a frame for the findings.

3.10.2 Transferability

This refers to the extent the research findings could be generalized to other contexts. Saunders (2000) defines generalizability as the extent to which research findings may be applicable to other research settings. Similarly, Jwan and Ong'ondo (2011) view generalizability in terms of the findings capacity to be applicable to other contexts in which the study was not done. In this study I argue that the study could be applied to other contexts where the trainees' pedagogical content knowledge is being studied.

This is because in Kenya teacher trainees are subjected to the same curriculum in all subjects or learning areas.

3.10.3 Dependability (Reliability)

Dependability refers to the accuracy of a research instrument. This means that an instrument should measure what it sets out to in order that incase the study is replicated in a different context the results would be similar. A dependable instrument should yield predictable and accurate results. I made clear and dependable descriptions of the methods which I used in generating data. The entire research process was given detailed and thick descriptions in a manner what made it possible to carry out a similar study in another context. Similarly, the use of varied sources of data which this study adopted led to the discovery of multiple facets of PCK in trainees teaching Physical Education.

3.10.4 Confirmability (Objectivity)

Confirmability or objectivity refers to neutrality of the study and the extent to which the research is influenced by the researcher. The results of the study should be based on facts from research findings. Objective results should be obtained from the data and be free from researcher's objective findings are free from internal and external influences of either the researcher or the participants. I used instrument triangulation which reduced any biases that may have arisen. The mixed research approach potentially reduced any form of biased influences that could have found their way into the research findings. During the study I kept notes of any information that was deemed necessary which minimized my biases.

3.11 Data Collection Procedures

Data collection procedures refer to the protocol that must be followed to ensure that data collection tools are applied correctly and efficiently. The researcher obtained the necessary permits from the Ministry of Education, Science and Technology (MoEST) and National Commission of Science and Technology (NACOSTI) to undertaken the study in the PTTCs and primary schools during the teaching practice session. Permit from NACOSTI was sought upon being allowed to proceed for data collection by Moi University. This was done by the dean School of Education who gave an introductory letter which was used to secure the relevant protocols from NACOSTI. The researcher sought the consent of the respondents to secure their willingness to participate in the study including the student teachers observed during practicum.

The researcher enlisted the participation of the Deans of Curriculum in each of the colleges as research assistants. They were given an orientation inorder to administer the student teacher's questionnaires and verify that they had been dully completed. A list of the sampled respondents was drawn and given to the Deans of Curriculum, to facilitate tracking and ease of collection of the questionnaires to assure an acceptable percentage of the response rate. The interviews for lecturers of Physical Education were carried out by the researcher. The interviews were recorded and later transcribed in order to elicit the qualitative data.

The lesson observation guides were undertaken during the practicum. Permission was sought from the college principals and head teachers in the school level to engage the student teachers and access the school respectively. Additionally, consent was sought from the sampled student teachers whose PE lessons were observed. The resource checklist was administered to find out the physical facilities and sports equipment that

were available in each college for teaching Physical Education. These included both real and improvised materials. The checklists were compiled for analysis.

3.12 Pilot Study

Pilot study to test the adequacy of research instruments and assess the feasibility of the study as part of research protocol to determine its workability was carried out in two Teachers Training Colleges. These were Murang'a Teachers College in Central Region and International Teachers College from Nairobi. The two were selected for piloting since they did not form part of the study sample. Data from the pilot study was analysed and informed a revision of the data instruments. Other aspects of the study that the pilot study aided to determine were the sampling procedures, sample size and format for data analysis.

3.13 Procedures for Data Analysis

Quantitative research can use statistical analysis, whilst qualitative research can target those groups in institutions or clusters of participants who might be approached to participate in the research.

The research study conducted various activities and processes in order to draw conclusions and make certain decisions regarding the data collected from the field. Both quantitative and qualitative data was generated by this study. Quantitative data was coded according to each variable and analysed using Statistical Package for the Social Sciences (SPSS) programme into frequencies and percentages. The qualitative data from interviews, observations and content analysis guides was transcribed labelled and classified respectively according to themes in order to answer the objectives of the study (Patton, 2002).

Table 3.3: Summary of data analysis

	Study Objective	**Type of data to be collected**	**Type of analysis**	**Mode of statistics**
1.	**Objective 1**: Adequacy of the content covered in the Primary Physical Education Teacher Education certificate course for preparation of student teachers	Ordinal Interval	Descriptive statistics	Frequencies percentages means
2.	**Objective 2:** Student teachers' perception of the relevance and value of the content in the Primary Physical Education Teacher Education curriculum for preparation of student teachers	Ordinal Interval	Descriptive statistics Qualitative analysis	Frequencies and Percentages Means Qualitative
3.	**Objective 3:** Effectiveness of student teacher's observed Physical Education PCK in influencing learner's outcomes during practicum	Interval	Descriptive statistics	Correlational analysis Spearman's or Pearson Product Moment
4.	**Objective 4:** Challenges encountered by student teachers in applying PCK in teaching Physical Education to learners in primary school during the practicum	Qualitative/textual	Descriptive statistics	Qualitative

3.14 Ethical Considerations

During the research I took cognizance of the legal and moral issues that informed ethical considerations. Creswell (2009) argues that in thinking about a research problem, a researcher needs to identify a problem that could be a benefit to the

participants. Furthermore, he says that a research problem should describe the purpose to the research participants so that they are not in doubt and to guard against deception. These are some of the ethical issues which were adhered to. Being practitioners in Physical Education either as trainees or trainers the participants would hugely benefit from the current study. The purpose of the research was clearly articulated in the relevant sections of the study and the various tools that were used for data collection. Prior to engaging the participants, I explained the rationale for the study. This enabled them take part in the study from an informed position.

3.14.1 Negotiating Access

Permission was sought from relevant authorities to gain access to the colleges before data collection. I wrote letters to the institutions detailing what the research was for, its scope and use, the expected outcome and the time to be taken. The Dean School of Education of Moi University gave me an introductory letter which I used in getting a research permit from NACOSTI. Similarly, the principals from the colleges gave me a letter which I used in introducing myself to the hosting headteachers and the teacher trainees.

3.14.2 Avoidance of Harm

Creswell (2009) emphasizes the need to uphold ethical standards that guard against putting participants at risk and respecting their vulnerability. I furnished the university with my research plan and schedule. The work plan defined the various tasks that needed to be undertaken during the research process.

3.14.3 Anonymity and Confidentiality

All the data obtained from individuals and the institutions has been treated with utmost confidentiality and used only for purposes of the study. The identities of the

respondents were not revealed as coded pseudonyms were used for analysis. Furthermore, the original data in both audio and transcribed forms was in the custody of the researcher and was deleted after the research study was completed.

As a researcher I ensured that no names of institutions and individual participants that were involved in the study were mentioned. This I did by giving each participating institution a code. Similarly, the participants were referred to in general terms and using codes. In this manner the identity of the institutions and participants were made anonymous to enhance ethical standards.

The researcher ensured that attention was paid to relevant ethical considerations. Two key issues were addressed as explained further below.

3.14.4 Access and Informed Consent

The participants signed a consent form. This is because I acknowledged the rights of the participants and which I undertook to protect during the process of data collection. I provided relevant information about myself and guarantees confidentiality by using codes to identify the Teacher Training Colleges and the participants. I equally assured the participants that the information would only be shared within the boundaries of shared consent.

All the principals of the institutions where data was be generated were informed in advance. The letter/permit allowing for the research was presented and their permission sought. The objectives of the study were explained to the student teachers and Physical Education lecturers before the questionnaires were administered and the interviews conducted respectively.

3.15 Chapter Summary

The chapter has presented aspects of research design which included: research approach, paradigm, study population, study site, sample size and sampling procedure, data collection instruments as well as ethical consideration. In chapter four, data presentation, interpretation and analysis was done.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents the findings of the study in relation to the influence of student teacher's physical education pedagogical content knowledge on achievement of learning outcomes in during Primary Teacher Education practicum. The objectives were to:

1. Determine the adequacy of the content covered in the Physical Education curriculum for teacher trainees;
2. Assess teacher trainees' views on the content of the Physical Education curriculum for teacher training;
3. evaluate the adequacy of the resources for teaching the Physical Education teacher in Teacher Training Colleges;
4. assess the effectiveness of trainees' PCK for curriculum delivery in primary schools during teaching practice;
5. examine the challenges encountered by teacher trainees in teaching Physical Education to learners in primary schools during teaching practice.

A total of 483 student teachers participated in the completion of questionnaires, 1 (one) in each college was observed during a PE practicum lesson. One lecturer of Physical Education in each of the colleges was interviewed and a checklist utilized to assess the facilities in each college. This chapter begins with presentation of biographic information on the respondents. The findings are then presented and discussed according to the objectives of the study.

4.2 Background Information on Sampled Colleges and Respondents

The study was conducted in 18 Primary Teacher's Training Colleges in the western region. The distribution of respondents per college is presented in the following graph

Table 4. 1: Distribution of Respondents by College

SUB-REGION 1

	Institution	Population	No. of respondents
1.	PTC 1	140	42
2.	PTC 2	117	35
3.	PTC 3	160	48
4.	PTC 4	157	47
5.	PTC 5	113	34
6.	PTETC 1	80	24
7.	PTETC 2	67	20
8.	PTETC 3	157	47
9.	PTETC 4	110	33
10.	PTETC 5	47	14
11.	PTETC 6	40	12
	SUB-REGION 2		
	PTC 1	137	14
	PTETC 1	110	33
	PTETC 2	33	10
	PTETC 3	23	7
	PTETC 4	33	10
	PTETC 5	37	11
	PTETC 6	50	15
	TOTAL	**1610**	**483**

KEY
PTC - Public Teacher Training College
PTETC - Private Teacher Training College

Physical Education Teacher Education (PETE) course is offered in both public and private teacher training institutions. The tabular presentations show the number of respondents drawn from the public and private institutions that were used in the study by category of college, gender and age range. The findings are presented in Tables 4.2, 4.3 and 4.4.

Table 4. 2: Distribution of Respondents by College Category

College Category	Frequency N = 483	%
Public	279	57.8
Private	204	42.2
	483	100

There are more public teachers training colleges than private ones nationally, therefore, the enrollment in public colleges tends to be higher than in private colleges. Additionally, the fees for the public colleges as determined by the Ministry of Education. Since the government subsidizes the costs for running public colleges, the training fees are slightly lower and thus, tend to attract more student teachers. Among the respondents 57.8% were from public colleges and 42.2% from private colleges. The disparities notwithstanding, in the context of this study, effective acquisition of PCK is essential regardless of whether a pre-service teacher is enrolled in a public or private college.

The respondents were further categorized by gender. This is presented in Table 4.3.

Table 4. 3: Distribution of Respondents by Gender

College Category	Frequency N = 483	%
Male	277	57.3
Female	206	42.7
	483	100

The findings revealed that male respondents in the study accounted for 57.3% whereas female respondents accounted for 42.7%. Physical Education is compulsory in all primary schools. Physical Education is also a compulsory subject for all student teachers enrolled for the Primary Teacher Education Certificate course for

them to qualify as trained teachers. Subsequently, they are all expected to teach Physical Education if they get employed. Regardless of gender, therefore, it is imperative that critical components that constitute PCK for PE be well articulated to ensure every student teacher is competent to teach the subject.

The respondents were further segregated based on their age. The findings are presented in Table 4.4.

Table 4. 4: Distribution of respondents by age range

Age range	Frequency N = 483	%
Under 20	7	1.4
21-30	452	93.6
31-40	22	4.6
Above 40	2	0.4
	483	100

According to the findings the majority of student teachers, 93.6% who participated in the study were within the age range of 21-30 years. The age range indicated that the respondents had been out of school for a considerable period of time before joining the colleges. This had implications on their beliefs and perceptions based on their experiences in participating or not participating in Physical Education and related activities during their school and out of school period. Their outlook and attitude towards Physical Education may have influenced their willingness to engage in the theoretical and practical aspects as well as appreciating the importance of lifelong engagement in exercise and sports.

The student teachers were further asked to indicate if they had been involved in teaching prior to their joining the pre-service teacher training course. This information is presented in Table 4.5

Table 4. 5: Pre-service teachers pre-training teaching experience

Pre-training Teaching Experience	**Frequency N = 483**	**%**
Below 12 months	252	52.2
1-2 years	204	42.2
3-4 years	26	5.4
Above 4 years	1	0.2
	483	100

Amongst the respondent student teachers, some had teaching experience prior to joining training. One of the respondents had above 4 years of teaching experience, 5.4% of the respondents had 3-4 years, 42.2% had 1-2 years and 52.2% of the respondents had less than a year of experience.

Undertaking teaching by an untrained individual provides opportunity to gain some insight in the process of teaching as a critical component of implementing curricula. Nevertheless, some practices acquired by the individual may not necessarily have been best practices. These may later become habits and therefore difficult to change even during training. From the study, each of the student teachers had gained a little work experience before entering PETE. This could imply that their beliefs and perceptions of Physical Education had been influenced by their experiences in school, leisure-time activities and during their teaching. These beliefs and perceptions could have a positive or negative impact on their approach to teaching Physical Education (Zeichner and Gore, 1990).

The student teacher training experience, however, may also have provided a chance for reflection giving the opportunity to compare their experiences as an untrained teacher and the expectation of a trained teacher. The accumulated knowledge through reflection on experience is an important aspect of teaching that comes to shape one's practice (Loughran 1997). Therefore, this understanding gained as a result of personal

reflection would help the student teacher put things into perspective and provide a thorough picture of the goals that have been achieved and of those that need to be set.

Being a reflective teacher implies that one is self-critical about the level of pedagogical content knowledge, subject-matter content knowledge and the suitability for selected teaching strategies in a certain teaching context. This self-evaluation, if performed in an honest manner, can offer the teacher useful insights into the aspects to rethink about, to adapt and improve in order to become a professional.

The respondents were further asked to provide their highest level of education. This was to affirm the system of education that they had been through. The results are presented in Table 4.6.

Table 4. 6: Distribution of years in which respondent's highest qualification was awarded

Range of years	**Frequency N = 483**	**%**
1990-1994	1	0.2
1995-2000	4	0.8
2000-2004	6	1.2
2005-2009	105	22
2010-2014	367	76
	483	100

From the findings in Table 4.6, the respondents were students who graduated from the current 8-4-4 system of education having done Kenya Certificate of Secondary Education (KCSE) examination. Majority of the respondents attained their highest qualification between 2010-2014 accounting for 76%, 22% indicated to have attained theirs between 2005-2009, 1.2% between 2000-2004, 0.8% between 1995-2000 and 0.2% between 1990-1994.

Due to the high stakes on examination in the 8-4-4 system, Physical Education has for years been neglected in implementation as it is not assessed during national

examinations. In this regard, the student teacher may not have had the opportunities to participate in and acquire the skills provided for in the PE curriculum both at primary and secondary education levels. Thus, during training, they would be exposed to the topical areas of PE to learn the specific skills yet at the same time learn how to teach the skills to young learners. This may affect their level of performance and precision in acquiring the PCK for PE.

4.3 Adequacy of the content covered in the Physical Education curriculum for teacher trainees

The first objective of the study was to determine the adequacy of the content covered in the Physical Education curriculum for teacher trainees. A range of relevant topical areas were selected from the PPETE syllabus. The topics were clustered into three categories which formed the study variables namely instructional strategies and representation, subject content knowledge and classroom practice. The three variables represented key components of the seven knowledge bases which form the minimum knowledge for teaching as identified by Shulman (1987). The respondents were asked to indicate the adequacy of coverage of the range of topics related to the study variables. The responses were given in relation to whether the topics were adequately covered, not adequately covered or not covered. The responses are presented in Table 4.7.

Table 4. 7: Coverage of topics in the PPETE syllabus

Variable	**Adequately covered**		**Not adequately covered**		**Not covered**		
Topic	*f (N=483)*	%	*f (N=483)*	%	*f (N=483)*	%	Total
	Instructional strategies and representation						
Learning Styles	455	94.2	27	5.6	1	0.2	100
Teaching methodology	444	91.9	38	7.9	1	0.2	100
Lesson planning	427	88.4	55	11.4	1	0.2	100
Communication techniques	278	57.6	179	37.1	26	5.4	100
Assessment of learning	376	77.8	98	20.3	9	1.9	100
Resource utilization	346	71.6	109	22.6	28	5.8	100
	Subject Content Knowledge						
PE Curriculum	360	74.5	118	24.4	5	1.0	100
Sports Skills	342	70.8	133	27.5	8	1.7	100
First-Aid	299	61.9	170	35.2	14	2.9	100
Adaptive PE	187	38.7	237	49.1	59	12.2	100
Micro –teaching	268	55.5	184	38.1	31	6.4	100
	Classroom practice						
Classroom organization	330	68.3	115	23.8	38	7.9	100
Classroom management	328	67.9	117	24.2	38	7.9	100

The first study variable instructional strategies and representation comprised of six components namely, learning styles, teaching methodology, lesson planning, communication techniques, assessment of learning and resource mobilization. The responses to the first study variable indicated that out of the six components five were rated as adequately covered by over 70% of the respondents. Majority of the respondents reported that the most adequately covered topics were learning styles (94.2%), teaching methodology (91.9%), lesson planning (88.4%), assessment of learning (77.8%) and resource utilization (71.6%). However, communication techniques were the exception having been rated adequately covered by only 57.1% and not adequately covered by 37.1% of the respondents.

Good communication is a fundamental skill which is at the core of effective teaching. Student teachers are expected to communicate effectively with their tutors and supervisors, colleagues, practicing teachers and learners. During practicum they also

engage with various administrators, parents and education personnel whom they encounter in the course of their training. They are therefore expected to enhance their interpersonal, listening, written and oral communication skills inorder to accomplish their responsibilities effectively. This forms a part of their professional development as teachers to ensure the student teacher can effectively deliver a lesson and receive meaningful feedback from the learners. The findings indicate that the content on communication skills was not adequate which may cause the student teacher not to acquire the per-requisite skills envisaged for effective teaching.

The second study variable subject content knowledge, comprised five components namely PE curriculum, sports skills, first aid, adaptive PE and micro-teaching. The responses to the second study variable indicated that only two of the components were rated adequately covered by over 70% of the respondents. These were PE curriculum (74.5%), and sports skills (70.8%). On the other hand, First-Aid was rated as adequately covered by only 61.9%, while micro-teaching and adaptive PE were rated as adequately covered by only 55.5% and 38.7% of the respondents respectively.

Teaching physical education exposes both the learner and teacher to both minor and serious injury as accidents can occur during practical lessons. The responses on the third component, first-aid by only 61.9% of the respondents indicated that the content was adequately covered, while 35.2% indicated the content was not adequately covered. The knowledge about first-aid for teachers of Physical Education is essential; it can save lives and avoid unnecessary distress calls from the specialized practitioners to maintain a life (Rodrigues, 2016). It is further noted that first-aid should be taught by personnel who are certified to administer the same. However, the study did not seek confirmation whether the tutors who teach Physical Education are certified to

administer first-aid. Nevertheless, the reported lack of adequate coverage of content could be a pointer to inadequate capacity of the tutors. The lack of or inadequate knowledge on first aid by the student teacher can cause one to incorrectly handle a learner who gets injured during a lesson. This could lead to legal action being taken against the person involved.

Adaptive Physical Education, the fourth component in the second study variable subject content knowledge, is a modified physical education program designed to meet the individualized motor needs, or other disability-related challenges of an individual learner. In the context of the Competency Based Curriculum (CBC), the same concept can be used to support learners who are yet to meet specific learning targets. 38.7% of the respondents indicated that the content on Adaptive Physical Education was adequately covered, while 49.1% indicated the content was not adequately covered. This depicts a deficiency in the opportunity to equip the student teachers with knowledge on how to modify or adapt activities to suit learners with special educational needs and disabilities or a learner temporarily disabled due to injury. In the spirit of inclusive education, knowledge on adaptive PE is essential as such learners are also integrated in regular schools.

Micro- teaching was the fifth component in the study variable subject content knowledge. Reddy (2019) espouses the critical role micro-teaching as an approach plays in enabling student teachers gain a deeper understanding of the teaching and learning process through undertaking micro-lessons. The process of preparation, teaching, critiquing and re-teaching provides opportunity for reflection and improvement of teaching methodology for varied content which in essence embeds PCK in practice. Therefore, the inadequate coverage or non-coverage of this topic

leaves the student teachers with little or no opportunity to practice inorder to effectively develop their teaching skills. A significant number of pre-service teachers according to the study therefore, missed out on a chance to adequately learn and apply a beneficial approach of teaching earlier mentioned as the reflective approach.

The third study variable classroom practice comprised of two components namely classroom organization and classroom management. The responses from the third study variable indicated that both of the components were rated as adequately covered by less than 70% of the respondents. Classroom organization was rated as adequately covered by 68.3% and not adequately covered by 23.8%, while classroom management was rated as adequately covered by 67.9% and not adequately covered by 24.2% of the respondents.

Classroom management refers to the process of ensuring that lessons are undertaken in a conducive environment that supports the learner's achievement of intended outcomes. It embraces actions the teacher undertakes to create a successful learning environment and to have a positive impact on students achieving given learning outcomes. The findings indicate that the content on classroom management was not adequately covered yet this is crucial to successful delivery of any lesson.

Classroom organization is about putting together a physical environment that promotes a safe and productive space for both the teacher and the learners. It is critical for the teacher to get their classrooms organized for each lesson undertaken to ensure the space is ready for learning. The responses from the student teachers indicated that the content on classroom organization was not adequately covered, thus reducing the student teacher's confidence in handling a successful lesson.

4.4 Teacher Trainees Views on the Content of the Physical Education Curriculum for Teacher Training

The second objective of the study was to assess teacher trainee's views of the content of the PE curriculum for teacher training. The topics were clustered into three categories which formed the study variables namely instructional strategies and representation, subject content knowledge and classroom practice. The three variables represented key components of the seven knowledge bases which form the minimum knowledge for teaching as identified by Shulman (1987). The respondents were asked give their views of the value of the content of the PE curriculum for teacher training. The responses were given in relation to whether the topics were very valuable, somewhat valuable or not valuable. The responses are presented in Table 4.8.

Table 4. 8: Topics Perceived of Value as a Basis for Preparation of Teachers

Variable	**Very valuable**		**Valuable**		**Not valuable**		
Topic	***f* (N=483)**	**%**	***f* (N=483)**	**%**	***f* (N=483)**	**%**	**Total**
Instructional strategies and representation							
Student Learning Styles	448	92.8	25	5.2	10	2.0	100
Teaching methodology	424	87.8	54	11.2	5	1.0	100
Lesson planning	435	90.1	48	9.9	0	0.0	100
Communication techniques	415	85.9	67	13.9	1	0.2	100
Assessment of learning	428	88.6	50	10.4	5	1.0	100
Resource utilization	435	90.1	43	8.9	5	1.0	100
Subject Content Knowledge							
PE Curriculum	381	78.9	95	19.7	7	1.4	100
Sports Skills	426	88.2	52	10.8	5	1.0	100
First-Aid	455	94.2	28	5.8	0	0.0	100
Adaptive PE	245	50.7	223	46.2	15	3.1	100
Micro –teaching	462	95.7	16	3.3	5	1.0	100
Classroom practice							
Classroom organization	322	66.7	114	23.6	47	9.7	100
Classroom management	326	67.5	130	26.9	27	5.6	100

The first study variable instructional strategies and representation comprised of six components namely, student learning styles, teaching methodology, lesson planning, communication techniques, assessment of learning and resource mobilization. The

responses to the first study variable indicated that all the six components were rated as very valuable by over 85% of the respondents. Majority of the respondents rated the topics to be of value as follows: student learning styles (92.8%), teaching methods (87.8%), lesson planning (90.1%), communication techniques (85.9%), assessment for learning (88.6%) and resource utilization (90.1%).

The second study variable subject content knowledge, comprised five components namely PE curriculum, sports skills, first aid, adaptive PE and micro-teaching. The responses to the second study variable indicated that four components with the exception of adaptive PE were rated as very valuable by over 75% of the respondents. The components that were rated very valuable by a majority of the respondents were PE curriculum (78.9%), sports skills (88.2%), first aid (94.2) and micro-teaching (95.7%). However, adapted PE was rated very valuable by only 50.7%, valuable by 46.2% and not valuable by 3.1% of the respondents.

The third study variable classroom practice comprised of two components namely classroom organization and classroom management. The responses from the third study variable indicate that both of the components were rated as very valuable by less than 75% of the respondents. Classroom organization and classroom management were rated as valuable by only 66.7% and 67.5% of the respondents respectively.

The respondents were further asked to indicate their perception of the level of difficulty of the various components of the subject content and pedagogical content which are provided in the PETE curriculum. Their responses are indicated in Table 4.9.

Table 4. 9: Level of Difficulty in Learning Topics in PETE Curriculum

Variable	Not difficulty		Moderately Difficult		Extremely Difficult		
Topic	*f (N=483)*	%	*f (N=483)*	%	*f (N=483)*	%	Total
Instructional strategies and representation							
Student Learning Styles	367	76.0	105	21.8	11	2.3	100
Teaching methodology	443	91.7	37	7.7	3	0.6	100
Lesson planning	409	84.7	73	15.1	1	0.2	100
Communication techniques	430	89.1	48	10.0	5	1.0	100
Assessment of learning	384	79.5	86	17.8	13	2.7	100
Resource utilization	379	78.5	86	17.8	18	3.7	100
Subject Content Knowledge							
PE Curriculum	422	87.7	55	11.3	6	1.2	100
Sports Skills	386	79.9	91	18.8	6	1.2	100
First-Aid	369	76.4	102	21.1	12	2.5	100
Adaptive PE	327	67.7	106	21.9	50	10.4	100
Micro –teaching	391	81.0	67	13.9	25	5.2	100
Classroom practice							
Classroom organization	370	76.6	100	20.7	13	2.7	100
Classroom management	376	77.8	92	19.1	15	3.1	100

The first study variable instructional strategies and representation comprised of six components namely, student learning styles, teaching methodology, lesson planning, communication techniques, assessment of learning and resource mobilization. The responses to the first study variable indicated that all the six components were rated as not difficult by over 75% of the respondents. The rating of not difficult by majority of the respondents was, student learning styles (76.0%), teaching methods (91,7%), lesson planning (84.7%), communication techniques (89.1%), assessment for learning (79.5%) and resource utilization (78.5%).

The second study variable subject content knowledge, comprised five components namely PE curriculum, sports skills, first aid, adaptive PE and micro-teaching. The responses to the second study variable indicated that four components with the exception of adaptive PE were rated as not difficult by over 75% of the respondents. The components that were rated not difficult by a majority of the respondents were PE

curriculum (87.7%), sports skills (79.9%), first aid (76.4) and micro-teaching (81.0%). However, adapted PE was rated not difficult by only 67.7%, moderately difficult by 21.9% and extremely difficult by 10.4% of the respondents,

The third study variable classroom practice comprised of two components namely classroom organization and classroom management. The responses from the third study variable indicate that both of the components were rated not difficult by over 75% of the respondents. Classroom organization and classroom management were rated not difficult by only 76.6% and 77.8% of the respondents respectively.

The findings show that in the topics that fall under the subject content knowledge and pedagogical content knowledge a majority of over 75% of the respondents indicated that they were able to undertake the requirements with little difficulty. This means that the subject content and pedagogical content presented to the pre-service teachers is relevant and appropriate for the level, thus facilitating the acquisition of the knowledge, skills and attitudes necessary for effective teaching of PE.

The results show that 67.7 % of the respondents had a little difficulty in learning Adaptive PE. On the other hand those that had moderate and extremely difficult experiences accounted for 21.9 % and 10.4 % respectively. Comparatively, out of all the topics, Adaptive PE had the lowest count of respondents who indicated the topic to be a little difficult and the highest count of respondents who indicated the topic to be moderately and extremely difficult. This is in line with previous teacher trainers and pre-service teacher's perceptions in terms of value, relevance and attitudes towards subject content.

Research demonstrates that increased experience and contact with students with special educational needs in conjunction with knowledge and training, results in more

positive attitudes (Akiba et al, 2011). It is therefore through practice that a teacher trainee can learn to achieve that by allocation of more time for topics that demand depth and experience. Teacher's attitudes are also to some extent influenced by the amount of training and knowledge they have received (Burke & Sutherland, 2004; Winter, 2006). However, researchers concluded that the most important factors on teachers' attitudes were exposure and experience with students with special educational needs (Akiba, 2011; Brown et al., 2008).

From interviews in this study, the interviewees acknowledged the lack of adequate time allocation for the subject content to be explored sufficiently. One of the PE lecturers responded by stating that time for learning was available but the time for practice was limited. The PE lecturer continued to add the following;

> "If its content, they are okay, but there is nothing in the practice (Goebei, TTC, June 14, 2017)".

Despite the lack of adequate time, their attitude towards sports and PE also determined their ability to effectively integrate pedagogy.

> "Those who were actively involved in sports had a lot of ease in terms of pedagogy. They were good in demonstrating skills and were in control of the class compared to those who neglected sports altogether. (Goebei, TTC, June, 2017)".

From Table 4.9, the general perception that is implied by majority of the respondents is that the topics in PETE curriculum were a little difficult except for components like Adaptive PE where one-third of the respondents experienced moderate and extreme difficulty.

The respondents were further asked to indicate how comfortable they are teaching PE to pupils in primary school. Their responses are indicated in Table 4.10

Table 4. 10: Pre-service Teacher's Assessment of How Comfortable they were Teaching PE

Variable	Frequency *N = 483*	%
Very Comfortable	158	32.7
Fairy Comfortable	213	44.1
Undecided	79	16.4
Not Comfortable	33	6.8
	483	100

From the findings in Table 4.10, indicated 32.7% of the respondents indicated they were very comfortable, while 44.1% were fairly comfortable. This affirmed that a majority of them were generally comfortable teaching PE to pupils in primary school. A few of the respondents were undecided accounting for 16.4% and those not comfortable teaching PE at all accounted for 6.8 %. Those not comfortable could be affected by lack of prior exposure to physical education or acquired attitudes from previous teachers or coaches. Muniu (1986) averred that students admitted into colleges have a limited background in PE leading to a situation which some tutors consider as reflecting a poor attitude towards the subject.

A further analysis was done regarding how comfortable the male and female respondents were teaching physical education in primary school. The responses are presented in Table 4.11.

Table 4. 11: Pre-service teacher's assessment of how comfortable they were teaching PE by gender

Variable	Male		Female	
	f (N=483)	**%**	***f (N=483)***	**%**
Very Comfortable	152	31.4	166	34.4
Fairy Comfortable	200	41.5	230	47.6
Undecided	89	18.4	66	13.6
Not Comfortable	42	8.7	21	4.4
	483	100	483	100

The findings presented in Table 4.11 indicate that generally the female student teachers were either very comfortable (34.4%) or fairly comfortable (47.6) as opposed to the male student teachers who were very comfortable (31.4%) and fairly comfortable (41.5%); giving a cumulatively rating of 82% comfortability and 72.9% for the female and male student teachers respectively. The study findings also show that the percentage of male student teachers who were not comfortable teaching physical education was double that of the female student teachers at 42% and 21% respectively. Additionally, the percentage of the undecided male student teachers was higher than that of the female student teachers at 18.6% and 13.6% respectively.

Numerous studies have been done in the past on the attitudes of pre-service teachers many of which have had contradicting inferences. This can be attributed to the diversity of how beliefs were inculcated to cultivate these attitudes. Findings from the table contradict the results of previous studies that reported that males show more positive attitude towards PE than females (Eagly, 1987; Shamshoum, 2003; Arabaci, 2009). Bearing in mind that the study had more male respondents than female, the expanse of this turnaround of popular belief is significant. From this study, gender stereotypes, myths and misconceptions concerning masculine and feminine tasks have been preserved through physical activity and sports. Though they are usually a reflection of social norms, findings from this study negate the existence of such stereotypes among the respondents. However, the fact that the female teacher trainees had positive attitudes towards PE may not necessarily translate into active participation in physical activities (Gitonga et al, 2011).

It was highly likely that the findings from this study did not entirely reflect any differences in attitudes towards PE and physical activity based on gender. It is arguable that the teacher trainees might have developed positive attitudes towards PE

due to the fact that it is an examinable subject in the college. Mahlmann et al. (1993) stated that PE lags behind in Kenyan secondary school because it is neither examinable nor required for promotion to the next class. Majority of the respondents in the study indicated fair and very comfortable levels in teaching PE.

This study also sought to establish pre-service teachers' enjoyment of participation in health and physical education activities. The results are as presented in Table 4.12.

Table 4.12: Pre-service teacher's enjoyment of participation in Health and Physical Education activities by gender

Variable	**Male**		**Female**	
	f (N=483)	***%***	***f (N=483)***	***%***
Enjoy a great deal	146	30.3	174	36.0
Enjoy a fair amount	155	32.1	159	33.0
Undecided	95	19.6	58	12.0
Not at all	87	18.0	92	19.0
	483	100	483	100

The findings presented in Table 4.12 indicate that majority of the respondents who enjoyed a great deal participating in health and PE activities were female accounting for 36.0 %, while the male accounted for 30.3%: the percentages for enjoying for a fair amount were 33.0% for the female respondents and 32.1% for the male respondents. Those who were undecided were 19.6% of the male respondents and 12.0% of the female, while those who did not at all enjoy participating in health and PE activities were 18.0% of the male respondents and 19.0% of the female respondents.

Some teacher trainees had no previous disposition. This was highly influenced by the pre-service teachers' former experiences and impressions thus have a traceable impact and strong influence on their future beliefs and practices (Curtner Smith et al, 2008). From the findings, it is evident that most of the respondents regardless of gender enjoyed participating in health and physical education activities.

The study further sought to find out the frequency of the teacher trainees participation in exercise activities. The findings are presented in Table 4.13.

Table 4. 13: Student teachers' frequency of participation in exercise activities

Variable	**Frequency** ***N = 483***	**%**
Regularly	263	54.4
Occasionally	124	25.7
Rarely	67	13.9
Not at all	29	6.0
	483	100

The findings presented in Table 4.13 show that 54.4% of the respondents indicated that they participate in exercise activities regularly, while 25.7% indicated they participated occasionally. Further 13.9% of the respondents indicated they rarely participated in exercise activities while 6.0% indicated they did not participate at all.

The teacher trainees who had regular physical activity had a more convenient way of demonstrating skills as they learn as their confidence levels were shaped by perceptions of activities during practice. Without daily physical activity, including recognition that it is a mandated curriculum expectation, and a sense of the way in which this can be implemented, it is unclear how these particular pre-service teachers will reconcile such challenges within their own future teaching practice.

The teaching of PE would be incomplete if certain critical resources are not provided. The researcher undertook to find out the resources available in the 18 sampled colleges by the use of a checklist. The findings are presented in Table 4.14.

4.5 Evaluate the Resources for Teaching the Physical Education Teacher in Teacher Training Colleges.

The third objective of the study was to find out the resources for teaching the Physical Education teacher in teacher training colleges. The data was collected using a checklist. The findings are presented in Table 4.14

Table 4. 14: Availability and adequacy of learning resources

	Available		Not available		Adequate		Not adequate	
	Count (n)	%	Count (n)	%	(n)	%	(n)	%
Playing fields	16	94.1	1	5.9	15	93.8	1	6.3
Courts	16	94.1	1	5.9	14	87.5	2	12.5
Markers	17	100.0	0	0.0	14	82.4	3	17.6
Tyres	7	41.2	10	58.8	3	42.9	4	57.1
Sacks	8	47.1	9	52.9	8	100	0	0.0
Books	17	100.0	0	0.0	17	100	0	0.0
Hoops	14	82.4	3	17.6	12	85.7	5	14.3
Boxes	8	47.1	9	52.9	5	62.5	3	37.5
Climbing frames	1	5.9	16	94.1	1	100	0	0.0
Balls	17	100.0	0	0.0	15	88.2	2	11.8
Ropes	17	100.0	0	0.0	15	88.2	2	11.8
Bean bags	11	64.7	6	35.3	8	72.7	3	27.3
Parachutes	2	11.8	15	88.2	1	50.0	1	50.0
ICTs	17	100.0	0	0.0	10	58.8	7	41.2
Ladders	2	11.8	15	88.2	2	100	0	0.0
Kites	1	5.9	16	94.1	0	0.0	1	100
Pebbles	10	58.8	7	41.2	10	100	0	0.0
Pieces of cloth.	16	94.1	1	5.9	16	100	0	0.0
Skittles	9	52.9	8	47.1	7	77.8	2	22.2
Nets	17	100.0	0	0.0	13	76.5	4	23.5

The study sought to first establish the resources available for teaching of the Physical Education teacher in teacher training colleges. The checklist developed included various facilities and equipment necessary for effective implementation of the PPETE curriculum. The findings presented in Table 4.14 indicate that not all the identified resources were available and adequate in all the colleges. The resources that were available in all the colleges were markers, balls, ropes, books, nets and Information Communication Technologies (ICTs including radio, Television, computers, laptops)

having been rated at 100%. The availability of playing fields, courts and pieces of cloth was rated at 94.1 % each and hoops at 82.4%.

Additionally, other resources available were beanbags (64.7 %), pebbles (58.8 %), skittles (52.9%), sacks (47.1%), boxes (47.1%), and tyres (41.2 %). The resources whose ratings in availability were very low included parachutes (11.8 %), ladders (11.8 %), climbing frames (5.9%) and kites (5.9 %). In all the colleges where the resources were available, most of them were adequate. Climbing frames and kites were available in only one (1) college, while ladders and parachutes were available in only two colleges. Nevertheless, they were all adequate for use in teaching PPETE.

Most of the resources were highly rated to be adequate by over 70% in a majority of the colleges. The resource rated highly in adequacy included sacks, books, climbing frames, ladders, pebbles and pieces of cloth at 100%, playing fields (93.5%), ropes (88.2%), balls (88.2%), courts (87.5%), hoops (85.7%), markers (82.4%), skittles (77.8%), nets (76.5%) and bean bags (72.7%). On the other hand the resources rated as adequate by less than 70% included boxes (62.5), tyres (42.9%) and ICTs (58.8%).

4.6 Assess the Effectiveness of Teacher Trainees PCK for Curriculum Delivery in Primary Schools During Teaching Practice

The fourth objective in this study was to assess the effectiveness of teacher trainees PCK for curriculum delivery's in Primary schools during teaching practice.

Table 4. 15: Reliability Statistics

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of Items
.939	.943	10

This study sought to measure the extent of consistency or reliability using the Cronbach's Alpha coefficient for internal consistency. Cronbach's alpha reliability coefficient normally ranges between 0 and 1. The closer the alpha coefficient (α) is to 1.0 the greater the internal consistency of the items in the scale. From the reliability statistics in Table 13, the alpha coefficient for the 10 items is α = 0.94, suggesting that the items have relatively high internal consistency. The higher the coefficient, the more reliable the test is therefore, it was excellently reliable and acceptable. The 10 items sufficiently measured consistency of the scale.

The reliability of this measurement refers to the extent that the scale was a consistent measure of the correlational influence of student teachers' content knowledge and pedagogical content knowledge on learning outcomes of primary school pupils in regards to physical education. This implies that the items were measuring the same characteristic. The scale items were interdependent with an internal consistency reliability coefficient α = .94. The items hereby strongly related to one another. It should however, be noted that while a high value for Cronbach's alpha indicates good internal consistency of the items in the scale, it does not mean that the scale is uni-dimensional. Factor analysis could have been used to determine the dimensionality of a scale but it was beyond the scope of this study. The results indicated the satisfactory level of influence of Content Knowledge and Pedagogical Content Knowledge on pupils' performance validity and internal consistency. The results also generated an

item statistics table that showed the means and standard deviations for each of the variables. The findings follow in Table 4.16:

Table 4. 16: Item Statistics

Item	Statistics		
	Mean	**Std. Deviation**	**N**
Teaching methods/approaches	3.36	.633	14
Mastery and sequence of content	3.21	.893	14
Class management	3.57	.852	14
Children involvement/participation	3.71	1.139	14
Communication skills (command of language, clarity, voice projection)	3.64	.633	14
Teacher participation (involvement, innovation, Confidence, devotion and enthusiasm	3.86	.864	14
Demonstration of skills	3.43	.852	14
Group participation	4.07	.829	14
Understanding of rules/instructions	3.57	.852	14
Observation of rules/instructions	3.71	.726	14

As shown in Table 4.16, the values exhibit fairly similar means of the individual items. This can be attributed to the fact that the items are in pursuit of a similar construct; in this case, influence of pre-service teachers' CK and PCK on pupils' performance. Notably, the variable *group participation* is an exception as its average score value 4.07 is relatively higher than the rest. The findings imply that comparatively, many responses disagreed with this variable.

The responses for the item *children involvement/participation* had the highest standard deviation (1.139). That is how spread out the responses for this item were from the mean of each item. It indicated that the responses for the item had the greatest variability of all. *Teaching methods* and *Communication skills* had the lowest variability of responses (0.633).

Inter item correlation matrix

An Inter-Item Correlation Matrix table for CK, PCK and pupil's Performance is given in Appendix II. This refers to a table showing the correlation coefficient of variable items in a correlation study. This table displays how each item correlated to all of the others. The correlations are used to measure the reliability of scale. That is, establishing the extent of consistency between multiple items measuring the same construct. The study measured 14 variables pertaining to Influence of Content knowledge and Pedagogical content knowledge on performance of pupils in physical education. The correlations among items within the scale were significant and they positively related to each other. Therefore, the scale is reliable.

From the Table 4.16, all the scales have statistically significant inter item correlations (>0.30), implying that the scales were reliable and measured the same variable in question. There was a significant positive correlation (r = 0.89) between *class management* and *understanding of rules/instructions*. This implies that as the teachers' ability to manage their classrooms increased, there was an increase in pupils who understood rules or instructions given to them. This in turn positively affected their performance in PE. Another positive correlation (r = 0.82) was noted between *Group participation* and *demonstration of skills*, which is also significantly correlated with *teacher participation.* From these results, as participation of the teacher increased, so did that of the pupils (r = 0.77). Increased participation in this case promoted more acquisition of skills hence the pupils' ability to demonstrate them. However, *teaching methods/approaches* exhibited a weaker positive correlation with *demonstration of skills* (r = 0.47). Comparatively, the most extreme positive correlation from the table was between *Group participation* with the *teachers' communication skills (r* = 0.35). This showed that teachers' *communication skills* had

a lower correlation with *group participation*. It was evident that when working in groups, the pupils would consult within their groups from the few that heard and understood the teacher because, their strong ability to demonstrate skills, understand and observe rules or instructions correlated strongly with group participation.

Pearson's Product Moment Coefficient (PPMC)

The ideal range of correlation coefficients is -1 to 1; the positive or negative sign show the direction while the number reveals the strength of the relationship. The most common way to quantify the relationship is by use of the PPMC. Pearson's correlation or bivariate correlation measures the strength and direction of association that exists between two variables measured on at least an interval scale. Pearson's correlation is used to determine the degree of linear relationship between the variables as presented in table 4.16 located in Appendix V.

The highest correlation score is found between the teachers' *class management* and pupils' *understanding of rules instructions* ($r = -.894$, $n = 14$, $p = < .001$). In other words, the pupils' degree of *understanding rules/instructions* highly correlated with that of the teachers' *class management*. A positive correlation is evident between *observation of the rules* and *class management* ($r = .657$, $n = 14$, $p = .011$). However, the significance value is greater than 0.05, rendering the correlation not statistically significant. It is highly likely that the pupils understood the rules though they did not necessarily observe them in relation to the teachers' class management. There is a positive correlation between *Teacher participation* (involvement, innovation, Confidence, devotion and enthusiasm and *demonstration of skills* ($r = .821$, $n = 14$, $p = < .001$). Since the results show a significance level less than 0.05, there is a significant correlation between the two. The study shows pupil's demonstration of skills is highly correlated with teacher participation. This implies that the pre-service

teachers were devoted and participated sufficiently to the extent of enabling pupils to demonstrate specific skills successfully.

From the Table, *children participation/involvement* and *teacher participation* had a statistically significant and negative correlation (r = .659, n = 14, p = .010). The findings implied that at some point, as the pre service teachers' increased their participation, the pupil's participation would decrease.

The results show a positive and significant relationship existed between *demonstration of skills* and *group participation* (r = -.825, n= 14, p = < .001) among the pupils. It is evident that a high correlation existed between the variables. This is in tandem with the constructivist and collaborative pedagogical approaches mentioned earlier in this study. These approaches are based on the belief that learning occurs as learners are actively involved in a process of meaning and knowledge construction. From the results, there is a strong and positive correlation between *teaching methods/approaches* and *children participation/involvement* (r = .686, n = 14, p = .007). The correlation between the variables is statistically significant. These approaches highly determine children participation hence they have an impact on performance.

*Children participation/involve*ment is correlated to *class management* as depicted in the table (r = .737, n = 14, p = .003). The correlation is strong and positive. Wright (2005) describes the core elements of classroom management as managing the space, the time, engagement and participation. A similar correlation exists between *group participation* and *class management* (r = .701, n = 14, p = .005). The results show a strong and positive correlation between the variable items *teacher participation* and *group participation* (r = .767, n = 14, p = .001).

4.7 Examine Challenges Encountered by Teacher Trainees in teaching Physical Education to Learners in Primary Schools During Teaching Practice

The fifth objective was on the challenges encountered by teacher trainees in teaching Physical Education to learners in primary school during teaching practice. The student teachers cited the first challenge to be inadequate coverage and/or completion of the content for the PPETE curriculum. This was corroborated by the lecturers who indicated that the content for the PPETE curriculum was wide and therefore they found it challenging to complete the same in the two-year period of the course.

> *I find the curriculum demands for the PPETE to be massive against the amount of time allocated. This has obvious impact on the way the trainees learn to content and how they later apply the same to teaching (T18).*
>
> *The curriculum demands that we teach the trainees a lot of things. Even then we don't cover everything. My fear is the trainees may not be able to relate everything they learn to what they teach in the field. (T 7).*
>
> *What happens when the trainees go for teaching practice without having mastered or even covered the syllabus is that we limit their capacity. I wish there was an element of specialization. Then the trainees should have more time to specialize in few teaching subjects for them to dedicate enough time to (T11).*
>
> *The problem of equipment is real. We cannot simply have enough for everybody. This means that trainees most likely go to the field without having had the opportunity to practice with critical equipment. (T5).*
>
> *I went to teach in a school which had more equipment than what I was used to. I simply could not handle some of the equipment on offer. (TN 15).*
>
> *The problem with an outdoor subject like physical education is that, it tends to share space with other activities for example games. Anytime you wish to practice on you own the information you have learnt in class you will get a group is using the outdoor space. Sometimes you have to fight for space with animals grazing on the fields (TN 11).*
>
> *Personnel is a serious issue in training. There are very few Physical Education educators. A college that boasts of more than two*

trainers is a very lucky college (T1)

When you are alone in an area it is tough going. You have nobody to discuss professional issues with. You cannot compare notes with anybody (T6)

The few trainers we have cannot be accessed by everybody. Chances are you may not get along with the only one. (TN 10).

Challenges associated with the teaching of PE during the practicum. Lack of relevant kits and equipment. Pupils especially in public schools rarely have the appropriate kits because unlike in private schools, PE kits are not mandatory. (TN2).

It is impossible to force pupils to wear appropriate uniform. As a teacher you might not comfortably demand that learners demonstrate skills without paying attention to how they are dressed (TN4).

Some of the playing surfaces are rough. You encounter learners struggling to perform given skills because they have no proper shoes. You empathize with the learner and as a human being you cannot push the learner so much. (TN6)

It is easy to ask learners to improvise equipment such as balls, hoops and bean bags. However, they cannot improvise PE kits yet you cannot punish a learner for not putting on the right kit because you appreciate that it is parents who ought to provide. (TN8).

Discriminating against learners on the basis of their lacking kits is unprofessional. All learners need to take part in the PE despite the need for special kits (TN 10).

Application

My greatest challenge is applying the principles we are taught when confronted with actual classroom realities. You end up doing things your own way. (TN 12)

We learn so much that it is possibly difficult to apply all the knowledge in teaching. You end up (TN 14).

It is easy to relate with some pedagogical demands such as making professional documents. There are others that are extremely difficult in PE. How do you differentiate your teaching to suit the needs of all learners despite this being the expected norm? (TN16).

Large classes

Classes are too big. The number of learners in these classes makes the teaching of PE extremely mechanical. Within a single lesson of 35 minutes, teaching the same skills to over 50 learners is simply superficial. (TN 18).

It is not possible to have a personal touch with the learners to help them individually with skills they are struggling in because they are too many. (TN 1).

Nothing sickens like a big class of learners. Your class control gymnastics are stretched to the limit. You want to give your best especially during assessment and so you end up being anxious (TN3).

Lack of physical fitness

I have a few obese learners. They are a headache, it is a struggle getting them to do anything physical yet they deserve physical exercises the most. (TN5).

Dealing with physically challenged learners requires time and patience. You don't want to isolate them yet they cannot perform at the same level with the rest. You are really pushed to the limits (TN7).

Learners' attitude

Learners are reluctant to take part in Physical Education. You have to admonish them and push them. It robs the subject of its joy (TN9).

Physical Education is not examinable. Little seriousness is not attached to the subject. It is not uncommon to be asked to surrender your PE classes to a teacher who wishes to have a make up (TN 11).

Some learners consider physical activities as punishment and not educative. This makes them rebel and need to be pushed. It takes a patient trainee to make such learners see the value of PE (TN 13).

Learners treat PE time as play time and not a serious subject. They mostly want to play and they will be happy if left to play on their own (TN 15).

Fear of accidents and lack of confidence

While teaching I am always haunted by the fear of the unknown. Should there be accidents, what shall I do when a learner is seriously injured in the course of PE? (TN9),

> *I did not push our learners so much. I do not want to see anybody hurt or injured since I have no First Aid kit. I cannot face up to realities of accidents (TN8).*

The second challenge cited was the inadequate facilities and equipment to be utilized for teaching and learning PE. The facilities referred to included the playgrounds, courts and fields while the equipment included markers, balls, ropes, books, nets and Information Communication Technologies (ICTs including radio, Television, computers, laptops). Encountered by pre service teachers is the lack of adequate facilities/equipment to aide in the teaching and learning of physical education. Where adequate, the facilities are poorly maintained or lack a qualified trainer to guide on the usage of equipment.

In many countries, teaching of Physical Education is facing several challenges (Hardman, 2009), such as decrease in the teaching time, decreasing curriculum, shortage in equipment, negative view of the teachers as well as students and guardians about physical education (Nyakweba, 2005).

This translates to another challenge, as there are few staff to teach physical education along with the equipment. The lack of equipment can be attributed to lack of funds or financial constraints, high prices of equipment and high budgetary constraints. This study shows that the availability and adequacy of learning materials determines the quality of interaction considering other factors such as time allocation, size of class and condition of the equipment. More interaction of learners and equipment indicates more engagement that translates to more knowledge for the learner. Njororai (1990) also noted the importance of facilities/equipment in the teaching and learning process of physical education and the fact that it plays a major part in creating a suitable classroom environment for the learners.

Inadequate time to cover PE content is also a challenge to pre service teachers. Apart from pre service teachers respondents indicating inadequacy of time vis a vis content, it was affirmed by PTE lecturer interviewees from this study the content is wide and the time allocated only allows the teachers and students to rush through it for completion. These challenges are closely knitted around how Physical education is perceived in learning institutions, with emphasis on the challenge posed by these perceptions. Consequently, the pre service teachers face the challenge of teaching the skills appropriately. Negative or positive attitudes towards PE emanates from the administrations, teachers, pupils and parents' perceptions.

With time allocation as a major challenge indicated in this study, there were also too many pupils in one class subsequently causing the challenge of teaching the skills in a good manner. This result was imputed to the fact that the impact of a crowded classroom weakens the ability of the teacher to teach the pupils, consider their strength and weaknesses then diligently take them through still with emphasis on little time allocation for content in physical education. The result showed consistency with a study conducted by Harrison (2005), which indicated that many of the sports programs were difficult to apply due to the increased numbers of the learners in the classroom, and to the insufficient learning time required for applying.

The study also highlighted the challenges related to lack of prior teaching experience among the pre service teachers whereby a majority of them had little experience. Such experience causes student teachers to develop personal beliefs and knowledge about teaching whereby through their teacher education, they are enculturated into the profession. Pre service teachers with prior experience perceive the profession different from those without. A lack thereof of prior experience may pose as a challenge for the pre service teachers as they integrate pedagogical skills.

4.8 Data Analysis and Interpretation

Based on the findings for the first objective, which was to determine the adequacy of the content covered in Physical Education curriculum for teacher trainees, the findings made insightful revelations. The outlined content areas which included communication, preparation of professional documents such as the lesson plan, teaching methodology, learning styles and assessment of learning are key to equipping the trainees with pedagogical content knowledge relevant to the feeding of physical education. These aspects resonate with the Ministry of Education's (2021) Physical Education and Sport Policy for Basic Education. The policy argues that Physical Education should focus on among other areas pedagogy, skill development and content related to various lifelong learning aspects such as health. The approach that the training has adopted in teacher preparation adequately empowers the trainees to implement the curriculum in schools and also assist learners in becoming lifelong physically active and healthy citizens.

A critical variable in pedagogy is preparation for instruction. This not only involves choosing appropriate and relevant teaching strategies but demands that teachers develop professional documents, design relevant expected learning outcomes, assembles the appropriate teaching and learning materials as well as appropriately asses learner achievement. The study found these aspects to be adequately coveted from the point of view of the curriculum.

Both trainers and trainees agreed that the prescribed content for physical education curriculum is wide that often times the curriculum is hardly covered. This is supportive of the fact that the content is adequate and is comprehensive enough.

Similarly, classroom practice in which class organisation and management were the studied characteristics which were identified as valuable. During class observation learning styles and instructional strategies adopted by trainees was evaluated. Teacher centred practice dominated most classroom observation. This means that the trainees sought to demonstrate discipline mastery outcomes in their teaching. The teaching style adopted by the trainees related Grossman's (1990) framework of PCK in which teaching styles and learner activity feature prominently. Other aspects which Grossman identifies include qualification and experience. These might not have been relevant to the current study since the participants having been trainees, were not expected to have any experience upon training. All the trainees have similar qualification given that they were yet to pass as qualified teachers. The trainees thus lacked diversity in qualifications they possessed.

The teaching styles were uniform. This strengthens the view that the trainees mainly attempt to teach PE the way they were instructed and had not gained relevant experiences that would prompt them to experiment with learner centred learning styles.

The professional documents were comprehensively prepared. The lesson plans for example communicated objectives that supported the trainees' PCK. PCK was demonstrated through clearly communicated short term goals. Trainees also communicated clear instructions that focused on the content taught. This was consistent with the work of Rink (2008) who postulated that successful instruction targets positive behaviour which the teacher wishes to develop. When teachers explain to learners what they are expected to learn and demonstrate the steps needed to do this learners are able to learn more effectively. On the whole trainees

demonstrated verbal support to learners, they demonstrated sufficient contextual knowledge and understanding of the abilities and used varied activities. These being aspects that positively defined PCK only strengthened the belief that the content of PCK for the Physical Education curriculum was adequate.

Based on the second objective which was to assess teacher trainees views on the content of the Physical Education curriculum for teacher training, all the variables were highly related as being either very valuable or simply valuable.

The variables were of three clusters. The first cluster comprised variables that characterized instructional strategies. These included student learning styles, teaching technology, lesson planning, communication techniques, assessment of learning and resource utilization. The high rating of the aspects demonstrates that the training is in tandem with the Ministry of Education's policy on physical Education which is to provide knowledge, skills, values and positive attitude through PE and sport for healthy lifestyle and lifelong learning.

Beyond the rating, the qualitative data obtained from trainees during the interview projected their rating of the variables. Two responses are given as illustration:

> *I really like the content of the course. Playing with games, communicating clearly and even assessing what learners can do, are challenging but extremely enriching (TN 14).*
>
> *Teaching through demonstrations and assessing what learners are doing and rating them to me is unique and enjoyable. Nothing satisfies more than playing (TN 10).*

The positive rating of the curriculum aspects demonstrates the confidence of the trainees. This is the product of the positivity of the trainees' learning along with external factors supporting them. Despite limited opportunities to practice due to challenges of space, the trainees' personal experience could play a role. Mahn and

John-Steiner (2002) argue that teachers need confidence because effective interaction towards learning between students and teachers is enhanced through confidence.

The positive mindset was a process of the trainees' socialization within Physical Education which the pre-service training reinforced. This resonates with Morgan (2008) observation that Physical Education succeeds when teachers and learners share a language of positivity. The practice of teaching learners to perform physical techniques fits neatly into the dictates of exploration, reflection and discussion which are all aspects of PCK. The trainees thus peg the teaching of PE at the same level with other educational concerns such as numeracy and literacy upon which learners' performance in tests has professional consequences (Jones and Green, 2014).

The study equally determined the perception of the trainees towards the subject content knowledge. Subject content knowledge formed the second cluster of variables which related to the PE curriculum, sports skills, First Aid, adaptive PE and microteaching with the exception of Adaptive PE, all the other variables attracted valuable perception of over 75%.

High rating of the content areas of Physical Education provides a strong foundation for the trainees to advance policies that would promote Physical Education on the learners and positively influence the culture of adopting Physical Education and related activities in schools for lifelong betterment. Perception and beliefs related to the content of Physical Education are assumed to play an important role in fostering and implementing the Physical Education agenda. Tsangaridou (2009) and Steinmann (2015) argue that special attention ought to be paid to the beliefs and perceptions of practitioners since they are the main determinants of teaching practices. This is so because they exert major influence on their student's learning outcomes in Physical

Education. The positive value attached to the content of Physical Education indicates that trainee's individual emotional judgement, thinking and action during the practicum would be equally be positive as to motivate the learners to perceive the subject as such. This is in tandem with the assertion of Skott (2015) who argued that shared beliefs, of which perception is a determinant, among teachers are supportive of prospective learners' outcomes. This is because perceptions are relatively stable and only change when meta-cognitive awareness are developed.

The third cluster of variable that was of interest to the study revolved around classroom practices and essentially targeted classroom organization and classroom management. Both were highly rated as valuable to the trainees. Classroom management and organisation are characterized by many factors which include maintaining learner co-operation, maintaining their involvement in instructional tasks, classroom leadership, discipline and the establishment of classroom atmosphere which promotes learning. Since the trainees positively valued these they essentially are aware that they are critical in determining learning outcomes since their study provided them with skills that would help them prevent behaviour problems through improved planning, organisation and class management. Similarly, they were aided on how to present instructional material and better teacher-student interaction aimed at maximizing student involvement. These views were captured during interviews with trainees after class observation:

I have learnt a lot about student classroom behaviour which should guide me when dealing with learner behaviour during my teaching. Through proactive management strategies I am able to limit disruptive behaviour that lead to confrontation in the class. (TN 16).

Classroom management is so vital because it means so much to the teachers and the learners increasing student contentment and enthusiasm for taking part in class activities compels learners to act the way you want them to.

The trainees therefore were able to directly connect what they learnt with their actual instructional practices hence their rating highly classroom management and organisation values.

Based on the third objective which was to evaluate the resources for teaching the Physical Education teacher in Teacher Training Colleges, the study based its findings on two critical aspects namely institutions of training and institutions where the trainees carried out their teaching practice from. The responses were not uniform; demonstrating the existing gulf between institutions in relation to the provision of instructional resources. Commonly identified resources included space such as playing fields, equipment such as balls and other related facilities which are key in realizing the curriculum goals of Physical Education. Resources aid teachers to be well equipped resulting in improved teacher performance. The choice of resources has obvious bearing on a teacher's application of pedagogical content knowledge. Whenever teachers incorporate relevant resources in teaching, learners get new insights to what they are learning. Most schools are incapacitated in terms of resources. This hampered the capacity of the trainees to fully put into practice the skills learnt and the attitudes developed.

The availability of relevant teaching resources makes teaching and learning easy, enjoyable and motivating. This may not be the case with the teacher trainees in Teacher Training Colleges especially with regard to Physical Education. The available resources are not uniformly distributed. Resources may not be self enacting.

Differences in their effects depend on differences in their use. With limited supply the trainees' capacity to put into practice pedagogical content knowledge is slightly hampered. These revelations emerged from the interview with trainees while discussing how they dealt with resource availability while demonstrating their knowledge to the learners in the schools they taught.

Despite the uneven distribution of teaching and learning materials, both within the training institution and teaching institutions the trainees regarded three main areas that demonstrated their pedagogical content knowledge in relation to teaching and learning materials. The first area regarded their capacity to evaluate and select adequate teaching and learning materials relevant to physical education during the practicum. Interviewed trainees stated that:

> *I select materials based on the objectives and tasks. I recall from our training that teaching objectives and teaching tasks provide the base teaching and starting point in the selection of teaching and learning resources. (TN 6).*

> *From my knowledge as a trainee, I know that my personality and the personality of the learner I teach is key. We learn differently and we have different psychological make up (TN 7).*

The second area which emerged as key driver of PCK is the presentation and interpretation stages in using the materials to teach. The interpretation and presentation should lead to free communication between teachers and learners. The reason for the selection and their collection highly depend on the trainees' knowledge gained through training. One of the trainees said:

> *My level of education should arm me with the relevant skills of leading and directing PE lessons with the aid of relevant materials. Similarly, I should be able to judge the features of the materials to make it possible for learners to use them safely and repeatedly. (TN 11).*

The final area in the determination of how PCK relates to the use of resources is evaluation. This relates to the extent to which the selected materials effectively mediate teaching and learning.

Each of the areas discussed demonstrate the application of PCK regardless of the distribution among institutions of resources. From the foregoing, it is apparent that the process of identifying, using and evaluating teaching and learning resources is a skillful one in which PCK, plays an integral role. A trainee's use of the resources which is the hallmark of teaching demands not only content but pedagogical and content knowledge (Reints, 2002). Using teaching and learning resources is meaning driven and is a representation of the knowledge gained that relates to specific subjects (Riding and Rayner, 2018).

Based on the fourth objective of the study which was to assess the effectiveness of the trainees' pedagogical content knowledge for curriculum delivery in primary schools during teaching practice, the study relied on data from class observation and interview to establish the objective. The trainee participants provided insightful renditions of their experiences which are summarized here under and which are used to interpret the findings.

> *Teaching practice is a learning platform. Trainees use the phase to build their knowledge and skill development even as they relay the curriculum to the learners (TN 18).*
>
> *The practicum is an opportunity in which I combine knowledge gained during training and what I know to build the experiences I say with the learners (TN 13).*
>
> *When teaching PE the activities I engage learners in and how I relate with the learners and behave within the class is determined by what I have learnt as a trainee, the content that I have and the content that I gained when I was learning. I try to make sure that all learners are following what is expected of them. So I give clear instructions (TN 12).*

Von Frank (2008) noted that PCK illustrates how the subject matter of a particular discipline is transformed during teaching for communication with learners. Consequently for successful application of PCK, teachers have to recognize why certain topics are difficult to learn, what learners bring into the learning context and the strategies tailored to a specific teaching situation. These elements were evident during the class observation and from interviews with the participants. The trainees demonstrated their knowledge by among other mechanisms demonstrating their subject matter knowledge. A few spoke to the content whereas some engaged learners in activities which showed that they understand how to teach even though not proficiently. They further demonstrated their knowledge by using subject specific terms and phrases. A few of these are reproduced here:

- Outdoor activities
- Line up
- Kick off
- Serve off
- Throw off

Refer to how different ball games are signaled to start

Internal set

Warm up

Drill

Burst

Endurance

During Physical Education lessons the trainees provided explanations to the specific words and phrases that related to the activity on course. Generally, the ability to relay content effectively is at the heart of effective teaching. The trainees demonstrated their readiness to improve the quality of their teaching by expanding their expertise in

Physical Education. The trainees displayed their knowledge base through the development of content and methodology related to PE.

Based on the fifth objective, which was to examine the challenges encountered by teacher trainees in teaching PE to learners in primary schools during the teaching practice, the findings reported include large classes, insufficient equipment, attitudinal challenges, limited time and shortage of qualified personnel to handle Physical Education both at the training level and at the institutional in schools. These challenges were qualitatively outlined by both trainees and trainers during face to face interviews. It is instructive to note that the challenges outlined are not only limited to the application of PCK only but affect teaching and training regardless of the teaching subjects. The challenges are therefore not unique to physical education only. They however pose greater problems if the learning area is one that is practical such as physical education. With specific reference to the current study these challenges threaten the realization of the policy goals of physical education as outlined in the physical education and sport policy for Basic Education. Despite the fact that the study was on teacher trainees during the practicum, the challenges point to an enduring situation that does not change regardless of objectives of the study. The attainment of PCK in classroom instruction as well as the realization of the policy objectives of PE depend on effective human resource management and development. Physical education teachers and trainers are key to quality learning as reported through their attitude, values and competencies which PCK addresses. Modern trends of implementation of curriculum instruction demand that competent personnel are attracted and retained for adequate experiential opportunities and support systems for physical education practicums.

The study revealed expansive PTE, PE curriculum as a challenge which undermined comprehensive coverage of the content and pedagogical aspects of trainees. The treatment of the content was thus superficial and lacked depth. This was manifested during class observation where a number of trainees had difficult relaying the content to the learners despite the fact that they reported adequate content of the curriculum. Rather than reduce the content the need for more time is paramount. This would translate into holistic development of trainees, for physical education instruction which currently faces inadequate assessment at the institutional level.

The study established insufficient resources for physical education as affecting both training and teaching. Most of the study participants identified common mandatory equipment as posing a great challenge for training and for teaching. The trainees especially pointed out outdoor space such as fields as limiting. Most primary schools are on small pieces of land that cannot accommodate several pitches to address the interest of divergent learners. Similarly, traditional equipment such as balls were reported to be a challenge. Balls were not just meant for PE but for sporting activities as well. Similarly, despite the fact that Information and Communication Technology as one of the main drivers of PCK was minimally used in PE instruction because of unavailability. In this respect there was little integration of ICT which was reported during class observation. This negatively impacts on the acquisition of digital literacy as a key competency to be acquired by learners; and undermines the capacity of both trainees and school learners to acquire relevant future skills to foster a culture of sport and enhance access, quality and equity in physical education.

Despite the fact participation in physical education is crucial for mental, social and physical well being learners in building healthy and active individuals who are

resilient to emergencies, the study reported negative attitude by learners and trainees as an obstacle. Negative attitude to physical education limits preparedness and response in delivering physical education and sport during emergencies. Furthermore, the resilience of learners and teachers is totally undermined rendering the mobilization and access to adequate facilities ineffective.

Unlike other subjects whose assessment procedures are easily structural, physical education was reported to suffer. It is not examined unlike other subjects and informal techniques of assessment were deemed subjective and extremely rigorous. Lack of structured mode of assessment affects effective monitoring, reporting and evaluation. Furthermore, provision of feedback for improved delivery of physical education is generally hampered. At a policy level, this challenge poses more challenges to policy administrators. Tracking the implementation of the physical education curriculum is not straight forward. Consequently, measuring the effectiveness, efficiency and quality of physical education instruction by trainees during practicum poses greater challenge. Training institutions' capacity to ensure adherence of standards lack sufficient information to develop clear procedures and processes for training physical education teachers.

4.9 Summary

This chapter presented data that was collected from the field on Primary Teacher trainees' application of PCK in teaching physical education during practicum. The data was further analysed and interpreted based on the study objectives in relation to existing literature. The subsequent chapter provides a summary of the findings, conclusions and recommendations.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a detailed discussion of the findings. It then proceeds to present conclusions, implication for policy and practice and suggestions for further research.

Broadly, the study aimed at gaining insight into the primary school teacher trainees interpretation of pedagogical content knowledge in teaching physical education. Towards this end five areas were interrogated based on the objectives. These were the adequacy of the content covered in the Physical Education curriculum for teacher trainees. Secondly, the teacher trainees views on the content of the PE curriculum for teacher training. Thirdly, the resources for teaching the PE teacher in Teacher Training Colleges. Fourthly, the effectiveness of teacher trainees' PCK for curriculum delivery in primary schools during teaching practice. Finally, the study focused on the challenges encountered by teacher trainees in teaching PE to learners in primary schools during teaching practice.

5.2 Conceptualization of Key Parameters of the Study

5.2.1 Conceptualization of Physical Education

In this study I conceptualized training content as the broad curriculum used for training physical education teachers. This provides an outline of the experiences which the trainees must be exposed to for them to qualify as teachers of physical education in primary schools. Physical education is an integral learning area in the holistic development of a learner. It provides an avenue for learners to be active in order to learn necessary skills knowledge and attitudes that lead to life long active lifestyle. Through physical education activities and programmes, the mental, social

and physical wellbeing of individuals is improved while creating a healthy and active society.

Furthermore, physical education leads to character building through socialization and integration. Physical education affords learners with the opportunity to acquire self-discovery skills and develop a sense of achievement, actualization and freedom. Physical education is both a learning subject and a career pathway and an enabler of sustainable development.

In the context of the foregoing, I was convinced that the context outlined in the design for training physical education teachers was sufficient in providing the trainees with the relevant skills that will make the pedagogically sound and knowledgeable enough to relay physical education experiences effectively to the level of learners for which they were training.

5.2.2 The Conceptualization of Pedagogical Content Knowledge

As a researcher, I consider professional learning of teachers as a process of knowledge building and skill development in effective teaching. Professional learning is an avenue through which teachers master both content and pedagogy. Teacher training provides trainees with rigorous and relevant content instruction that enables the trainees to teach effectively through the provision of content and their integration in different contexts. Like Shulman (1986) I consider content pedagogical knowledge as interpretations and transformations of subject matter knowledge on teaching and teacher preparation in specific subject matter in facilitating student learning. It is a specially constructed combination of content and pedagogy which teachers construct in a special way in addressing diverse contexts of teaching. The development of PCK is influenced by factors related to the teacher's personal

background and the context in which they work pedagogical content knowledge is subject specific and is defined by general aspects relevant to individual subjects such as why certain aspects of a subject are difficult and the conceptualization which learners bring into learning the subject.

By and large, effective content teaching is determined by a teacher's content knowledge. The improvement of the quality of teaching and learning demands expanding the insights of experts who commit to high quality professional development.

5.2.3 Conceptualization of the Teaching Practice

Teaching Practice is a critical phase in teacher preparation in which teacher trainees are provided with an opportunity to try out teaching roles upon exposure to theoretical aspects of teaching and content in varied subjects.

It is a vital component in teacher preparation since it among other things:

- Allows trainees to practice what they have learnt
- Provides trainees with opportunities of handling professional issues expected of a teacher
- Enables trainees to develop confidence in handling instructional as well as other issues through practice.

Teaching Practice demands adequate preparation and cultivation of friendly personality in improving micro-teaching skills.

Human Resource Development and Management For Physical Education

Strategy	Activities	Performance Indicator	Responsibility
Enhance Pre- and In-service training in P.E and sport.	Develop pre and in- service training materials aligned to P.E and sport curriculum and emerging trends.	No. of training materials developed	MOE / KICD/TSC / TTCs
	Conduct In-service training of P.E and sport facilitators.	% of qualified facilitators trained	TSC/MOE/
Strengthen continuous Professional Development for P.E and sport	Develop professional development programmes on P.E. and sport.	No. of programmes developed	MOE/ TSC/KNEC
	Build capacity of teachers and facilitators on professional developmental programmes in P.E and sport.	No. of facilitators	MOE/KNEC/ TSC/ KNATCOM
	Develop standards for P.E and sport facilitators and coaches.	No. of standards	MOE/ TSC
	Sensitize facilitators and coaches on P.E and sport standard.	No. of facilitators and coaches sensitized	TSC / MOE/TTCs / KNATCOM
	Monitor and evaluate adherence to P.E and sport standard.	No. of reports	MOE/ TSC / KNATCOM
Enhance professional code of conduct for P.E and sport facilitators.	Organize programmes in P.E and sport professional code of conduct for facilitators.	No. of programmes	MOE / TSC / TTCs/ EP
Diversify the modes of teaching and learning in P.E and sport.	Induct P.E and sport facilitators on emerging teaching learning methods for basic education curriculum.	% of facilitators using diverse modes	MOE / TSC / TTCs
Enhance coaching and mentorship programmes for P.E and sport teachers/facilitators	Develop coaching and mentorship programmes to capacity build P.E and sport teachers	No. of P.E and sport teachers'/ facilitators sensitized	MOE/ TSC
Provide workforce for inclusive teaching and facilitation of P.E and sport curriculum.	Train P.E and sport facilitators.	No. of facilitators trained in P.E and sport by category	MOE
	Place facilitators in learning institutions by category.	No. of trainees absorbed by category	TSC
	Develop guidelines for registration of professional coaches.	No. of guidelines developed	MOE/TSC
	Sensitize coaches on the guidelines.	No. of coaches sensitized	MOE/TSC/ KNATCOM

Rebrand the teaching of P.E and sport	Vet and register P.E and sport professional coaches.	No. of coaches registered	MOE/TSC/ MOSCH
	Establish and maintain a data base of registered P.E and sport professional coaches.	Real time data base	MOE/TSC
Promote recruitment of qualified teachers/ facilitators and educators	Deploy qualified teachers/ facilitators and educators	No. of learning institutions with substantive P.E teachers/ facilitators	TSC
Policy Statement: Strengthen the experiential opportunities and support systems.			
Enhance P.E and Sport outcome-based assessment	Develop and administer assessment tools in line with other subjects	No. of outcome-based assessments annually	MOE/KNEC
Promote use of innovative teaching and learning resources.	Review related literature on innovative learning approaches	No. of reports	MOE/TSC/KICD
	Develop programmes on innovative learning	No. of programmes	MOE/TSC/KICD/ KNEC
	Train P.E and Sport teachers on innovative strategies	No. of teachers/ facilitators reached	MOE/TSC/KICD
Enhance teamwork between teachers/facilitators and students	Develop P.E and sport team work strategy	No. of strategy	MOE/TSC/KICD
	Sensitize teachers and learners on the importance of team work	No. sensitized	Institutions
Foster parental involvement and community engagement in P.E and Sport.	Develop guideline for parental involvement and community engagement.	No. of guideline developed	MOE/ KICD/ KNATCOM/ MOSCH/ ADAK
	Sensitize key stakeholders on the guidelines.	No. reached	MOE/ KICD/ KNATCOM
Enhance opportunities for peer learning, mentorship and communities of practice in P.E and Sport.	Develop programmes for peer learning, mentorship and communities of practice programmes.	No. of programmes developed	MOE/ KICD/ KNATCOM
	Sensitize learners on existing P.E and sport opportunities	No. reached	MOE/ KICD/ KNATCOM

5.3 Summary of Key Findings

The purpose of this study was to investigate the influence of primary teacher trainnees Physical Education pedagogical content knowledge on their learners competence during teaching practice. Given the wide spectrum that teacher preparation covers, it was necessary to delineate a specific learning area and in this context, physical education was selected. Further, the study restricted itself to trainees' pedagogical content knowledge in physical education within the context of teaching practice.

The first objective sought to determine the adequacy of the content covered in the Physical Education curriculum for teacher training. The study revealed that both content and pedagogical elements of physical education were adequately provided for. Concepts covered included learning styles, teaching methodology, lesson planning, assessment of learning, resource utilization and sports skills. Classroom management techniques were on the whole averagely covered. The classroom management techniques that required more time to be covered included classroom organization, class management, First Aid, communication techniques, micro-teaching and adaptive PE.

The second objective sought to assess the teacher trainees views on the content of the Physical Education curriculum for teacher training. Four key areas were identified as being relevant in providing to the teacher trainees. These were learning styles, lesson planning, teaching methods and sports skills. Despite being critical in developing the trainees' competence in teaching, areas related to the development of pedagogical content knowledge were reported to be challenging to the trainees. The trainers pointed out insufficient time as a contributing factor in limiting the competent acquisition of pedagogical content knowledge due to the broad nature of the content compared to the limited time.

The third objective sought to evaluate the resources for teaching the Physical Education teacher in Teacher Training Colleges. The correlational statistics conducted exhibited fairly similar means of individual items. This means that the variables of class management and understanding rules and instructions influenced the trainees content knowledge and pedagogical content knowledge. These were seen to influence learners' performance. Furthermore the study demonstrated a positive correlation between teacher participation and learners' involvement in terms of devotion, confidence, enthusiasm and the development of skills.

The fourth objective sought to assess the effectiveness of teacher trainees' pedagogical content knowledge for curriculum delivery in primary scholls during teaching practice. The trainees demonstrated relevant skills that enabled their design and select materials that were relevant in teaching physical education especially in contexts where the resources were constrained. The materials used were appropriate and were safe for use by the learners and trainees. The choice, selection storage and use demonstrated skillfulness which was the product of trainees application of relevant content pedagogical knowledge.

The fifth objective sought to examine the challenges encountered by teacher trainees in teaching Physical Education in primary schools during teaching practice. Lack of adequate facilities and equipment that addressed the needs of large classes of learners, poorly maintained facilities and few qualified physical education experts were challenges that were revealed. Inadequate time to cover the physical education content was cited as an inhibitor

5.4 Conclusion

The study concluded that even though the trainees demonstrated pedagogical content knowledge when teaching physical education during the teaching practice, the concept is broad and its study during the period may not have been adequate. Some trainees were better grounded in their demonstration of PCK than others. PCK is complex in nature thus placing demands of its framework in a hierarchy in order to determine the influence of each component would have aided the study more.

From the findings, the study concludes that although some aspects of PCK in teacher preparation were adequately covered, there is a deficiency in components that are pertinent to the effective preparation of the teacher trainee and therefore may impact negatively on the PCK and subsequently the performance of the learners.

The study concludes that trainees' curricular knowledge of physical education is critical in highlighting how their pedagogy and content knowledge addresses the learning needs of learners. Contexts of teaching keep changing along with the body of learners therein. This demands that the trainees change and adapt to varied situations if they are to effectively demonstrate their PCK in specific learning areas such as physical education and in addressing specific elements of classroom instruction such as the use of instructional resources.

5.5 Recommendations for Policy and Practice

The findings of the current study have implications for key players in teacher education, generally and physical education teacher education specifically. Generally the study established that the training content of teacher training adequately prepared teachers both in content and pedagogy based on the level of training offered by primary teacher education institutions. This may not be conclusive. The study thus

makes the following recommendations given the potentially significant benefits that can be derived from this area.

5.5.1 Recommendations for the Ministry of Education

The Ministry of Education is critical in teacher education since it is in charge of teacher training programmes. Based on the findings of the study the Ministry of Education could consider the following to bolster teacher training:

1) Encourage specialization in primary teacher education. This would expose those who wish to specialize in physical education to the theoretical and practical orientations of their specializations including better grounding on PCK.
2) Upscale the number of years for teacher training to a minimum of three years for effective coverage of all the skills and content needed in a learning area. This would aid teacher trainees deeply master the PCK of PE.
3) The Ministry of Education, through its agencies such as the Kenya Institute of Curriculum Development should ensure the quality and sufficient supply of resources relevant for training in PE in all teacher training colleges.
4) Provision of more time for teaching practice would ensure that all subjects are sufficiently exposed to by the trainings including PE if the trainees have to be impactful on learners' competence.

5.5.2 Recommendations to Teacher Training Colleges

It is recommended that TTCs:

1) Adopt innovative ways of training that gives trainees the opportunity of being responsible for their learning. This would ensure that the trainees are well grounded on PCK of physical Education.

2) Expose trainees to modern and innovative resources such as those that involve ICT.
3) Teacher trainers should actively involve pre-service teacher trainees in learning and knowledge construction in physical education. Teacher trainers should be encouraged to use varied teaching and learning approaches that are learner centred since teacher trainees teach learners how they were taught in their initial teacher preparation course. Some of the learner centred approached that should be adopted in training physical education teachers include; participation and involvement of teacher trainees, demonstrations, group activities among others.

5.5.3 Recommendations to Trainees and Teachers of Physical Education

1) It is possible for trainees and practicing teachers to establish communities of practice. These could act as foundation upon which ideas related to physical education are discussed to keep abreast with the changing trends nature and knowledge base in the subject.

2) Identify avenues for continuous professional development and enlist with such avenues to continuously improve knowledge and skill in physical education.

5.6 Suggestions for Further Studies

The current study sought to determine the application of PCK by teacher trainees in teaching physical education during the practicum. More studies could be conducted along the following lines:

(a) Study of trainees' application of PCK in teaching other subjects during teaching practice.
(b) An evaluation of teacher trainees' perception of PCK in different teaching subjects.

REFERENCES

Adeyemi, M.B. (1989). The good social studies teacher. *Kenya Journal of Education* 4:2, pp. 166-176.

Aglazor, G. N and Obi, F. B., (2016). Teaching practice handbook for programmers, students and supervisors. University of Calabar Press, Calabar, Nigeria.

Aglazor, G., & Orim, O. O. (2019). Teacher Variables and Implementation of Inclusive Education in Ikom Education Zone of Cross River State, Nigeria. *International Journal Of Contemporary Social Science Education (IJCSSE)*, *2*(1). University of Calabar, Calabar, Cross River State, Nigeria.

Ajisafe, M.O. (1997). Some hints on the status of physical education in Africa. *ICSSPE BULLETIN* No. 23

Amade Escot,C. (2000). The contribution of two research programs on teaching content: "pedagogical content knowledge" and "didactics of physical education. *Journal of Teaching Physical Education*, 20(1), 78101.

Bain, L. (1990). The subject-matter preparation of teachers. In W. Houston, (Ed.), *Ha ndbook of Research on Teacher Education,* (pp. 758-781). New York: Macmil lan.

Ball, D. & McDiarmid, G. (1990). The subject matter preparation of teachers, in W. Houston, (Ed.), *Handbook of Research on Teacher Education* (pp. 437449). New York: Macmillan.

Ball, D. L., & Bass, H. (2000). Interweaving content and pedagogy in teaching and learning to teach: Knowing and using mathematics. In J. Boaler (Ed.), *Multiple perspectives on mathematics teaching and learning* (pp. 83–104). Westport, UK: Ablex.

Bandura, A. (1989). Social cognitive theory. In R. Vasta (Ed.), *Annals of child development. Vol. 6. Six theories of child development* (pp. 1-60). Greenwich, CT: JAI Press

Borg, S. (2006). *Teacher Cognition and Language Education*. London: Biddles Ltd.

Borko, H., & Putnam, R. T. (1996). Learning to teach. In D. C. Berliner & R. C. Calfee (Eds.), *Handbook of Educational Psychology* (pp. 673–708). New York: Macmillan.

Bruner, J.S. (1961). The act of discovery. *Harvard Educational Review*. 31 (1).

Cohen l., Manion L., Morrioson K. (2018). *Research Methods in Education*, Eigth Edition, Routledge, Taylor & Francis, NewYork.

Combs, A W. (1970). *The Professional Education of Teachers*. Boston, M.A Alleyn and Bacon Inc.

Constantinides, P., Montalvo, R. & Silverman, S. (2009, Apr.). Comparison of teaching behaviours in elementary physical education classes taught by specialists and non-specialists. Paper presented at the American Educational Research Association Annual Meeting, San Diego, Apr. 13-17, 2009.

Creswell, J.W. (2009). *Research Design: Qualitative, Quantitative and Mixed Method Approaches* (3rd Ed). Sage Publications, Inc.

Creswell, J.W. (2009). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches* (3rd Ed). London: Thousand Oaks, California.

Creswell, J.W. and Creswell, J.D. (2018). *Research Design: Qualitative, Quantitative and Mixed Method Approaches*. Sage: Los Angeles

Darling-Hammond, L. (2000). Teacher quality and student achievement: a review of state policy evidence. *Education policy Analysis Archives*, 8 (1), 1-49.

Denzin, N. K., & Lincoln, Y. S. (2005). *Handbook of Qualitative* Research (3rd ed.) Thousand Oaks, CA: Sage Publications.

Department of Education. (2003). Revised National Curriculum Statement Grades R the Development of Learning Programmes. Technology: Pretoria. Government printers

Dewey, J. (1997). *How we think, Mineola*. New York: Dover.

Dewey, J., (1938). *Experience and Education.* New York: Collier.

Difiore, G.J. (2010). The shape of physical education, health and wellness programs in high-need middle schools. Doctoral Dissertation, New York University.

Elbaz, F. (1983). *Teacher Thinking: A Study of Practical Knowledge*. London. Croom Helm

FernandezBalboa, J. (1997). Knowledge base in physical education teacher education: a proposal for a new era. *Quest*, 49, 161-181.

Fletcher, T., (2011). Learning to Teaching Health and Physical Education: The Experiences of Elementary Student Teachers, University of Toronto: Canada.

Galloway, J. (2007). *Fit kids-smarter kids*. Oxford: Meyer and Meyer.

Gan, Z. (2013). Learning to Teach English Language in the Practicum. What Challenges do non-native ESL Student Teachers Face? *Australian Journal of Teacher Education*, 38(3).

Ganu, D. (2019). "Prevalence and Contributing Factors for Overweight and Obesity in Children 0-18 Years in Sub Saharan Africa for 20-Year Period: Systematic Review". *Acta Scientific Nutritional Health* 3.12: 67-72.

Gerring, J. (2006). *Case study research: Principles and practices*. Cambridge University Press.

Gess-Newsome, J. (1999). Pedagogical content knowledge: An introduction and orientation. In *Examining pedagogical content knowledge: The construct and its implications for science education* (pp. 3-17). Dordrecht: Springer Netherlands.

Gitonga, E.R., Andanje, M., Wanderi, P.M., & Bailasha, N. (2012). Teacher-trainees attitudes towards physical education in Kenya. *Journal of Educational Research and Reviews* Vol. 7(27), pp. 585-588,

Gower, R., Walters, S., & Phillips, D. (1983). *Teaching practice handbook*. London: Heinemann.

Graber, K. C., Locke, L. F., Lambdin, D. & Solmon, M. A. (2008). The landscape of elementary school physical education. *The Elementary School Journal*, 108(3): 151-159.

Grant, H., & Kristie B. L., (2004). Physical Education Teachers' Perceptions of the Adequacy of University Coursework in Preparation for Teaching. *Physical Educator*, 00318981, Vol. 61, Issue 2

Grossman, P. (1990). *The making of a teacher: Teacher Knowledge and teacher education.* New York: Teachers College Press.

Grossman, P. L.,Wilson, S. M., & Shulman, L. S. (1989). Teachers of substance: Subject matter knowledge for teaching. In M. Reynolds (Ed.), *The knowledge base for beginning teachers* (pp. 23-36).New York: Pergamon.

Gumbo, M.T. & Makgato, M. (2008). *Dealing with the relational aspects of Technology education*: Study Guide. Pretoria.

Gumbo, M.T. and Makgato, M. (2008). Teachers' Pedagogical Content Knowledge in Graphical Communication Concept. A Case of Selected Township Schools. *Journal of Curriculum Research Studies.*

Hardman, K. & Marshall, J. (2000). The state and status of physical education in international context. *European Physical Education Review*, 6(3): 203-229.

Hardman, K. & Marshall, J. (2009). Second world-wide survey of school physical education: Final report. Berlin: ICSSPE/CIEPSS.

Hardman, K. (2008). Physical education in schools: a global perspective. *Kinesiology*, 40 (1), 5-28.

Hastie, P. & Vlaisavljevic, N. (1999). The relationship between subject matter experts and accountability in instructional tasks. *Journal of Teaching in Physical Education*, 19 (1), 2233.

Hendry, L.B. (1975). Survival in a marginal ROle. The Professional Identity of The Physical Education Teacher. *The British Journal of Sociology*, 26, 465-476.

Hendry, L.B. (1975). Human factors in sports systems: suggested models for analyzing athlete-coach interaction. In: HT.A Whiting (ed). *Readings in sports psychology 2.* London: Lepus Books, pp.27-50.

Hopkins , D. (2002). *A Teacher's Guide to Classroom Research* (3rd Ed). New York Open University Press.

Jacob, F. N. A., John, S. A. O., & Gwany, D. M. (2020). Teachers' pedagogical content knowledge and students' academic achievement: A theoretical overview. *Journal of Global Research in Education and Social Science, 14*(2), 14-44.

Jenkinson, A.K. & Benson, C.A. (2010). Barriers to providing education and physical activity in Victorian state secondary schools. *Australian Journal of Teacher Education*, 36 (1), 1-17

Jones, R.L., Edwards, C., and Green, I.T. (2014). Activity theory, complexity and sports coaching: An epistemology for discipline. *Sport, education and society, 21* (2) 200-216

Kahiga, R.M. (2014). A comparative evaluation of the implementation of the physical education curriculum in Nairobi and Nyeri pre-schools. Unpublished PH.D. Thesis, University of Nairobi: Kenya.

Kane, J.E. (1975). Perception of personal characteristics by physical education teachers and coaches. In: H T. A Whiting (Ed.) *Readings in sports psychology 2*. London: Lepus Books, pp.18-26.

Kent A.M. (2004). Improving teacher quality through professional development. Education: Spring. Retrieved on October 23, 2010, from http://findarticles.com/p/articles/mi_qa3673/is_3_124/ai_n29092860

Khumalo, S. B. (2004). The implementation of Technology Education as a Learning area. Tshwane University of Technology D.Ed Thesis.

Kiganjo, G.M. (1987). An investigation into problems encountered by Physical Education tutors in the implementation of the P.E. curriculum in Kenyan Teachers Training colleges. Unpublished M.Ed Thesis. Kenyatta University. Nairobi: Kenya.

Kinoo, M.N. (1999). A critical study of methods and materials used to teach History and government in secondary schools in Kenya. Unpublished Ph.D. Thesis, Kenyatta University, Nairobi: Kenya.

Livingston, L. (1996). Redefining the role of physical activity courses in the preparation of physical education teaching professionals. *The Physical Educator*, 53, 114-121.

Madeje,B.V. (1981). Evaluation of the implementation of Physical Education programme in Dar- es-Salaam city primary schools. Unpublished M.Ed Project. Kenyatta University. Nairobi: Kenya.

Magnusson, S., Krajcik, J., & Borko, H. (1999). Nature, sources and development of pedagogical content knowledge for science teaching. In J. Gess-Newsome & N. G. Lederman (Eds.), *Examining pedagogical content knowledge: The construct and its implications for science education* (pp. 95-132). Dordrecht, The Netherlands: Kluwer Academic.

Mahlmann, P., Asembo, J. M. and Korip, M. (1993). An analysis of sport in Kenyan educational institutions. *Journal of Eastern African Research and Development*, 23: 160-175.

Mahlmann, P., Asembo, J. M. and Korir, M. (1994). A target oriented analysis of sport in Kenya. *Journal of Eastern African Research and Development***,** 24: 102-117.

Mahn, H., and John-Steiner, V. (2002). The gift of confidence: A Vygotskian view of emotions. *Learning for life in the 21st century, 46-58*

Makgato, M. & Mji, A. (2006). Factors associated with high school learners' poor performance: a sportlight on mathematics and physical science. *South African Journal of Education*, 26 (2), ISSN 0256-0100.

Makgato, M., Khumalo, S.B and Mafisa, L. (2006). The implementation of technology education: A South African experience. A paper presented at the SAARMSTE Conference 2006 the University of Pretoria, Pretoria from 9 -12 January 2006.

Mandigo, J. (2010). Presenting the evidence: Quality physical education for Canadian children and youth position statement by Physical & Health Education Canada. *PHENex Journa*l, 2(1). Retrieved January 12th 2016 from: http://ojs.acadiau.ca/index.php/phenex/article/view/5/1158.

MoE (2021). *Physical Education and Sport Policy for Basic Education*. Nairobi: GoK

Morgan, P. (2008). Non specialist teachers' confidence to teach Physical Education: The nature and influence of personal experiences in schools. *Physical Education and Sport Pedagogy* 13(1): 1-29

Mugenda, A.G. (2008). *Social Science Research: Theory and Principles*. Acts Press: Nairobi.

Muniu, R. (1986).An evaluation of the effectiveness of the Physical Education curriculum in Diploma colleges. Unpublished M. Ed Thesis. Kenyatta University, Nairobi: Kenya.

Nguyen, T. T. L. (2019). Selection of research paradigms in English language teaching: Personal reflections and future directions. *KnE Social Sciences*, 1-19.

Njoroge, R.J. and Bennaars G.A. (1986), Philosophy of education in Africa, Nairobi, Kenya Trans-africa Press (Since its first publication, the book has undergone number of impressions.

Njororai WWS (1994). Physical education and Sport as part of education- for- all: The Kenyan case. Basic Educ. *Forum* 5:49-53.

Njororai, W. W. S.. (1990). Assessment of the Physical Education Learning Resources in Selected Secondary Schools in Uasin Gishu District. Unpublished M.Ed. Thesis, Kenyatta University, Nairobi, Kenya.

Njororai, W.W.S. (1994). Physical Education and sport as part of Education for all: *The Kenyan case Basic Education Forum*, Vol 5: pp.49-53.

Olsen, D. (1999). Constructivist principles of learning and teaching methods. *Education.* Vol 120.

Ong'ondo and Jwan (2011). *Qualitative Research Process*. Nairobi: JKF

Ong'ondo and Jwan (2020). *Qualitative Research Process: From Conceptualization to Examination*. Nairobi: JKF

Piaget, J. (1972). *The psychology of the child*. New York: Basic books

Pikulski J.J (2000). Increasing reading achievement through effective reading instruction (Tech.Rep.No. 19716). Newark, DE: University of Delaware, School of Education.

Polnsky and Weller (2004). *Writing up Qualitative Research*. London: Sage Publications.

Prince, M.J. & Felder, R.M. (2006). *Inductive teaching and learning methods: definitions, comparisons, and research bases.*

Reints, A. J.C., (2002). *A Framework for Assessing the Quality of Learning Materials. In: New Educational Media and Textbooks.* Stockholm: Stockholm Institute of Education Press.

Republic of Kenya 2021. Physical Education and Sport Policy for Basic Education

Riding, R., and Rayner, S. (2018). Cognitive Styles and Learning Strategies: Understanding Style Differences in Learning and Behaviour. London: David Fulton Publishers.

Rikard, G. & Knight, S. (1997). Obstacles to professional development: interns desire tofit in, get along, and be reach teachers. *Journal of Teaching in Physical Education,* 16,440-453.

Rink, J.E. (2008). *Teaching Physical Education for Learning* (4th ed.). New York: McGraw-Hill.

Rivers J.C & Sanders W.L (1996). Cumulative and residual effects of teachers on future student academic achievement: Knoxville: University of Tennessee Value-Added Research and Assessment Center.

Saunders, M. (2000). *Research Methods for Business Students*. London: Pearson Education

Schempp, P., Manross, D., Tan, S., & Fincher, M. (1998). Subject expertise and teachers' knowledge. *Journal of Teaching in Physical Education,* 17, 342-356.

Schneider, R. M. & Krajcik, J. (2002). Supporting science teacher learning: The role of educative curriculum materials. *Journal of Science Teacher Education,* 13(3), 221 -245.

Schwab, J. J. (1978). Education and the structure of the disciplines. In I. Westbury & N. Wilkof (Eds.), Science, curriculum, and liberal education (pp. 167-183). Chicago: University of Chicago (Original work published 1961)

Shulman, L. S. (1986). Those who Understand: Knowledge Growth in Teaching. *Educational Researcher,* 15, 4-14.

Shulman, L. S. (1987). Knowledge and Teaching: Foundations of the New Reform. *Harvard Educational Review,* 57, 122.

Siedentop, D. (1990). Undergraduate teacher preparation. In C. Corbin & H. Eclert (E ds.), *The Academy Papers: The Evolving Undergraduate Major* (pp.28-34) Champaign, IL: Human Kinetics.

Singer, P. (1972). Famine, Affluence and Morality. *Philosophy and Public Affairs* Vol Nos (1972) pp. 229-243

Singh, AI. (1982). Physical Education and Sports: Programming in schools. *Snipes Journal,* vol. 5:2 pp.

Skott, J. (2015). The promises, problems, and prospects of research on teachers' beliefs. In Fives, H. and Gill, M.G. (eds), *International Handbook of Research on Teachers' Beliefs.* Routledge, New York, NY, pp. 13-30

Steinhardt, M. (1992). Physical Education. In P. Jackson, (Ed.), *Handbook of Research on Curriculum* (pp.964-1001). New York: Macmillan.

Strand, B. (1992). A descriptive profile of teacher preparation practices in physical education teacher education. *The Physical Educator*, 49, 104-112.

Taylor, P. C. (2010). Transformative educational research for culturally inclusive teaching. Keynote address delivered at the 7th International Conference on Intercultural Competence, Khabarovsk, Far East Russia.

Taylor, P. C., & Settelmaier, E. (2003). Critical autobiographical research for science educators. *Journal of Science Education Japan*, 27, 233-244.

The Kenya National Commission for UNESCO (2019). A rapid assessment on the current status of teaching and learning of P E and sport in schools.

Tsangaridou, N. (2009). Teachers' beliefs. In Kirk, D. (ed). *The Handbook of Physical Education.* SAGE, London, pp 486-501

UNESCO (2015). Quality Physical Education (QPE): Guidelines for Policy-makers. Paris

UNESCO. (1978). International charter of physical education and sport. UNESCO.

Vithal. R. & Jansen, J. (1997). Designing your first research proposal. A manual for researchers in education and the Social Sciences Cape Town: Juta

Vivies-Rodriguez, M.E. (2005). Pre-school Physical Education: A case study of the factors that Influence movement instruction to Pre-school children. Unpublished Ph.D Thesis. The Florida State University College of Education: USA.

Vygotsky, L.S. (1978). Mind in Society: The Development of Higher Psychological Processes. Cambridge, MA: Harvard University Press

Wamukoya, E. (1994). 8-4-4 secondary school physical education curriculum in Kenya. In L.O. Amusa (Ed.) Proceedings of the 1st Africa Regional Conference on Physical, Health Education, Recreation and Dance, 4th-7th, October. Gaborone, Botswana: AFAHPER-S.D., pp. 157-169.

Willis, J. W. (2007). *Foundations of qualitative research: Interpretive and critical approaches.* Thousand Oaks, CA: Sage Publications

Wilson, S., Shulman, L., & Richert, A. (1987). "150 different ways of knowing": Representations of knowledge in teaching. In J. Calderhead (Ed.), *Exploring teachers' thinking* (pp. 104-123). Eastbourne, UK: Cassell.

APPENDICES

Appendix I: Teacher Trainees Questionnaire

The purpose of this questionnaire is to obtain information for the study on influence of primary teacher trainees Physical Education pedagogical content knowledge on their learners' competence during teaching practice. The information you give is confidential and will be used only for the purpose of the study. Your co-operation and assistance in completing this questionnaire will be highly appreciated. Kindly answer all the questions honestly.

Please answer the questions by ticking (√) in the brackets or write in the spaces provided.

County: _____ College: _____ Type of college: Public ( ) Private ( )

SECTION A: TEACHER'S BACKGROUND INFORMATION

1. Gender Male ( ) Female ( )
2. Age in years
   (i) Under 20 ( ) (ii) 21-30 ( ) (iii) 31- 40 ( ) (iv) Above 40 ( )
3. Prior Teaching experience
   (i) Less than 12 months ( ) (ii) 1-2 years ( ) (iii) 3-4 years ( ) (iv) 5 years and above ( )
   (v) None ( )
4. Highest academic qualifications
   (i) KCPE/CPE ( ) (ii) KCSE/O-Level ( ) (iii) A-Level ( ) (iv)Any other (specify)……..
   ……
5. Indicate the year you were awarded your highest qualification: ……

SECTION B: RELEVANCE OF CONTENT OF PHYSICAL EDUCATION FOR TEACHER TRAINING

6. a) Indicate which of the following components are covered in the physical education by ticking in the table provided below:

	PE topic/learning area	Covered	Not adequately covered	Not covered	Comment
1.	Student teaching				
2.	Lesson planning				
3.	Knowledge of physiology				
4.	Teaching Methods				
5.	Knowledge of anatomy				
6.	Sports skills/knowledge				
7.	Fitness concepts				
8.	Motor development				
9.	PE Curriculum				
10.	Health concepts				
11.	First aid/CPR				
12.	Adaptive physical education				
13.	Classroom/gym management				
14.	Classroom (gym) organization				
15.	Historical perspective on PE				
16.	Fitness testing				
17.	Assessment of learning				
18.	Grading practices				
19.	Communication skills				
20.	Discipline techniques				
21.	Sports law				
22.	Integration of movement with other subjects				

6 b) Are the PE objectives in the syllabus clear, relevant and achievable?

Yes ( ) No ( ) Give reasons for your answer.

……

……

……

7. Rate the value of each of the components in relation to preparing you to teach physical education effectively. Use the scale provided.

   1 = no value 2 = little value 3 = undecided 4 = somewhat valuable 5 = very valuable

	PE topic/learning area	**Very Valuable**	**Somewhat valuable**	**Undecided**	**Little value**	**No value**
1.	Student teaching					
2.	Lesson planning					
3.	Knowledge of physiology					
4.	Teaching Methods					
5.	Knowledge of anatomy					
6.	Sports skills/knowledge					
7.	Fitness concepts					
8.	Motor development					
9.	PE Curriculum					
10.	Health concepts					
11.	First aid/CPR					
12.	Adaptive physical education					
13.	Classroom/gym management					
14.	Classroom (gym) organization					
15.	Historical perspective on PE					
16.	Fitness testing					
17.	Assessment of learning					
18.	Grading practices					
19.	Communication skills					
20.	Discipline techniques					
21.	Sports law					
22.	Integration of movement with other subject					

8. a) Rate the level of difficulty of the following teaching responsibilities based on your experience during your first session of teaching Physical Education. Use the scale provided below

1. = no difficulty 2. = little difficulty 3. = undecided 4. = moderately difficult
5. = extremely difficult

	Teaching responsibility	**No difficulty**	**Little difficulty**	**Undecided**	**Moderately difficult**	**Extremely difficult**
1.	Facilities/equipment					
2.	Discipline					
3.	Special needs populations					
4.	Schedule interruptions					
5.	Personal fatigue					
6.	Assessment/ grading					
7.	Classroom Management					
8.	Parental contact					
9.	Differences in skill level					
10.	Liability concerns					
11.	Motivating students					
12.	Lack of administrative support					
13.	Curriculum selection					
14.	Colleague relationships					
15.	Teacher/student relationships					
16.	Lesson planning					
17.	Teaching sports skills					

b) Give any other challenges you may have experienced

……

……

……

……

Give suggestions on how these challenges can be overcome.

.....

.....

.....

.....

SECTION C: TEACHER HEALTH, & PHYSICAL ACTIVITY

FOR THE NEXT TWO QUESTIONS, USE THE FOLLOWING SCALE:

1 = Not At All, 2 = A Little, 3 = Neutral, 4 = A Fair Amount, 5 = A Great Deal

9. To what extent do you feel comfortable with physical education and/or physical activity?

1[ ] 2 [ ] 3 [ ] 4[ ] 5 [ ]

Please give a brief explanation of the response you have given.

10. As a pupil in elementary and high school, to what extent did you enjoy health and physical education?

1[ ] 2 [ ] 3 [ ] 4[ ] 5 [ ]

Please give a brief explanation of the response you have given.

11. Which of the following best describes your current physical activity and exercise pattern?

Tick ONE only

a) I am not physically active and I don't intend to start [ ]

b) I am not physically active but I'm thinking about starting [ ]

c) I am physically active once in a while but not regularly [ ]

d) I am physically active regularly but started only in the past six months [ ]

e) I am physically active regularly and have been so for longer than six months [ ]

f) I was physically active regularly in the past, but not now [ ]

If you selected option f, which of the following BEST describes your current position?

i) I don't intend to start being physically active again [ ]

ii) I'm thinking of starting to be physically active again [ ]

THANK YOU

Appendix II: Interview Schedule for Physical Education Lecturers

(Relevance and impacts of the physical education programme)

The purpose of this interview is to obtain information on the teaching and learning of Physical Education in primary schools by teacher trainees. Your co-operation and assistance will be highly appreciated.

Name of college: _____

Type of college: Public ☐ Private ☐

1. What in your opinion is the role of PE as a subject in the PTE curriculum? Probe for the role of PE in achievement of national goals of education.

2. How much time is allocated for teaching PE? Probe for adequacy of time in relation to the content to be covered.

3. In your opinion, is the preparation given to pre-service teachers adequate to equip them with adequate content and pedagogy to effectively teach PE? Explain

4. Comment on the availability and adequacy of learning resources for PE in your college in terms of facilities, equipment, reference books and storage facilities.

5. What is the attitude of pre-service teachers towards PE? Explain

6. In your opinion, are the objectives of PE achieved in your college? Explain

7. What challenges do you face in the teaching of PE? How do you overcome those challenges?

THANK THE INTERVIEWEE

Appendix III: Lesson Observation Schedule

Name of college of teacher trainee:
Type of college: Public ☐ Private ☐
Name of Primary School:
County: Class: Date: No. of Pupils in class: Topic/Sub-topic:

PART A: TEACHER PERFORMANCE

Tick appropriately on a rating scale of 1-5 where
1=poor 2= fair 3=average 4= good 5=very good

	TEACHING ACTIVITY						**COMMENT**
1.	Preparation for teaching	1	2	3	4	5	
	Scheme of work Relevance to syllabus Statement of objectives Appropriateness of content Lesson Planning Format Time allocation Appropriateness of learning activities Appropriateness of learning resources						
2.	Lesson Presentation						
	Introduction: warm up activities Lesson development free and directed activities Teaching methods/approaches Mastery and sequence of content Class management Children involvement/participation Conclusion: cool down activities						
3.	Teaching resources						
	Type of resources Variety Adequacy Utilization improvisation						
4.	Personal factors						

	Attire Communication skills (command of language, clarity, voice projection) Teacher participation (involvement, innovation, Confidence, devotion and enthusiasm						

PART B: PUPIL PERFORMANCE

	Pupils Activities	1	2	3	4	5	**COMMENT**
	Demonstration of skills Group participation Exhibition of team spirit Understanding of rules/instructions Observation of rules/instructions						

Appendix IV: Resource Checklist

A checklist on availability of learning resources used in the teaching of PE in teachers colleges

Name of college: _____

	RESOURCES	**AVAILABILITY**		**QUANTITY**		**QUALITY**	**USAGE**
		Available	**Not available**	**Adequate**	**Not adequate**	**Good Bad**	**Adequately utilized Not adequately utilized**
1.	Playing field						
2.	Courts						
3.	Markers						
4.	Tyres						
5.	Sacks.						
6.	Hoops						
7.	Boxes						
8.	Climbing frames						
9.	Balls						
10.	Ropes						
11.	Bean bags						
12.	Parachutes						
13.	Ladders						
14.	Kites						
15.	Pebbles						
16.	Pieces of cloth.						
17.	Skittles						
18.	Nets						

Appendix V: Proposed Work Plan

Time Frame	Activity
November/December 2015	Proposal Defense
January 2016	Fine tuning proposal
February 2016	Completion of proposal
May 2016	Piloting and finalization of data collection instruments
June 2016	Data collection
June /July 2016	Data Analysis
August 2016	Compilation of first draft
September 2016	Writing of the second draft
October 2016	Submission of report

Appendix VI: Map of Study Area (Western Region)

Appendix VII: Research Letters

MOI UNIVERSITY
Office of the Dean School of Education
Tel: (053) 43001-8
(053) 43555
Fax: (053) 43555
P.O. Box 3900
Eldoret, Kenya

REF: MU/SE/PGS/54 **DATE:** 3rd June, 2016

The Executive Secretary
National Council for Science, Technology
and Innovation
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

RE: **RESEARCH PERMIT IN RESPECT OF JACQUELINE ONYANGO – (EDU/D.PHIL.C/1007/12)**

The above named is a 2nd year Doctor of Philosophy (PhD) student at Moi University, School of Education, Department of Curriculum, Instruction and Educational Media.

It is a requirement of her D.Phil Studies that she conducts research and produces a thesis. Her research is entitled:

"Impact of Pre-Service Teachers' Pedagogical Content Knowledge on Primary Pupil's Performance in Physical Education in Kenya."

Any assistance given to enable her conduct her research successfully will be highly appreciated.

Yours faithfully,

PROF. J. N. KINDIKI
DEAN, SCHOOL OF EDUCATION

JNK/db

CONDITIONS

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 Officers 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

REPUBLIC OF KENYA

National Commission for Science, Technology and Innovation

RESEARCH CLEARANCE PERMIT

Serial No. A 9724

CONDITIONS: see back page

THIS IS TO CERTIFY THAT:
MS. JACQUELINE CHIMUNGENI ONYANGO
of MOI UNIVERSITY, 8921-100
NAIROBI,has been permitted to conduct research in *Bungoma , Kakamega , Kisii , Kisumu , Migori , Siaya , Vihiga Counties*

on the topic: *IMPACT OF PRE SERVICE TEACHERS PEDAGOGICAL CONTENT KNOWLEDGE ON PRIMARY PUPILS PERFORMANCE IN PHYSICAL EDUCATION IN KENYA*

for the period ending:
21st June,2017

.....
Applicant's Signature

Permit No : NACOSTI/P/16/18895/11896
Date Of Issue : 22nd June,2016
Fee Recieved :ksh 2000

.....
Director General
National Commission for Science, Technology & Innovation