CORRELATION BETWEEN TEACHERS RELATED FACTORS AND STUDENTS' ACADEMIC ACHIEVEMENT IN PUBLIC SECONDARY SCHOOLS IN BARINGO COUNTY, KENYA

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DECLARATION

Declaration by Student

This is my original work and has not been submitted for the conferement of a degree or award of a diploma in this or any other university.

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DEDICATION

This thesis is dedicated to my wife Daisy and children; Carthy, Edwin, George, Ruth and Meshack.

ABSTRACT

The significance of instructional leadership as it relates to students academic performance has assumed greater importance in education today as stakeholders demand for greater accountability. Teacher factors other than instructional leadership have been under scrutiny to determine their related influence of student academic performance. The purpose of this study was to examine the relationship between selected teacher factors and student achievement in public secondary schools in Baringo County. This study examined the relationship between four teacher factors namely; instructional leadership, qualification, experience and attitude towards teaching and students' academic achievement. The study adopted the descriptive survey research design. The target population of the study was 1070 secondary school teachers from 122 public secondary schools. A sample size of 291 teachers was selected using stratified and simple random sampling techniques. The study used a teachers' questionnaire and a document analysis form to collect data. The teachers questionnaire was examined for construct and face validity by a team of experts in Moi University. The comments of the experts were incorporated in the instruments before it was used in the field. The teachers questionnaire was also piloted for reliability and yielded an Alpha coefficient of 0.748. Data was analyzed with the aid of the Statistical Package for Social Science. Frequencies and percentages were used to summarize and describe data whereas the Multiple regression, Pearsons and Spearman correlations analysis were used to establish relationships. The results revealed that there was a significant relationship between students' achievement and teachers' instructional leadership ($r=.165$, $p<.05$), experience ($r= .272$, $p<.05$) and attitude towards teaching ($r=.153$, $p<.05$). However, the relationship ($r=-.027$, $p>.05$), between students achievement and teachers qualification was not significant. The regression analysis revealed that teachers' instructional leadership ($ß= .208$, $p<.05$), experience ($ß = .281$, $p<.05$) and attitude towards teaching ($ß=.129$, $p<.05$) contribute significantly towards variations in students achievement whereas teachers qualification ($ß= -.023$, $p>.05$) does not. The analysis further revealed that the four explanatory variables explained 14.8% ($R^2 = ,148$) variation in students academic achievement. The findings will be important to the school management in establishing significant variables for articulating and adoption, researchers in identifying variables that create the greatest influence in improving student performances and policymakers in allocating resources in capacity building of school managers and the may assist administrators, researchers, and teachers.

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ABBREVIATIONS

CDE	County Director of Education
DEO	District Education Officer
DOS	Director of Studies
EFA	Education For All
EP	Emergency permit
GOK	Government of Kenya
KCSE	Kenya Certificate of Secondary Education
KNEC	Kenya National Examinations Council
MDGs-	Millennium Development Goals
MOEST	Ministry of Education Science and Technology
NBPTS	National Board for Professional Teaching Standards
NBTEE	National Business and Technical Education Examinations
NECO	National Examination Council
NESC	National Economic and Social Council of Kenya
SEP	Science Education Project in South Africa
SPSS	Statistical Package for Social Studies
SSCE	Senior School Certificate Examination
TACs	Teacher Advisory Centres
TSC	Teachers Services Commission
UNESCO	United Nations Educational Scientific and Cultural Organization

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CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1 Introduction

This chapter provides an overview of the study. It presents the outline of the background to the study and the statement of the problem. It states the purpose of the study, objectives of the study, hypotheses of the study, justifications of the study, significance of the study, scope and limitations of the study, the theoretical framework and operational definitions of terms.

1.2 Background to the Study

Education is a very important human activity. It helps any society fashion and model individuals to function well in their environment. According to Boit, Njoki and Chang'ach (2012), the purpose of education is to equip the citizenry to reshape their society and eliminate inequality. In particular, secondary education is an important sector in national and individual development. It plays a vital role in creating a country's human resource base at a level higher than primary education (Achoka, Odebero, Maiyo & Mualuko, 2007). One of the indicators of quality of education being provided is cognitive achievement of learners (United Nations Educational, Scientific and Cultural Organization, [UNESCO], 2005). According to Adediwura and Tayo (2007), academic achievement is designated by test and examination scores or marks assigned by the subject teachers. It could also be said to be any expression used to represent students' scholastic standing.

Wolfenson (2000) stated that education gives an individual a productive future; helps in making decisions and enhance confidence. Education also provides a ladder for achieving success in life and enables one to utilize skills in a constructive way. It is a

key determinant of earnings, an exit route from poverty and can reduce social and economic inequality (Government of Kenya [GOK], 2005). The role of education is not just to impart knowledge and skills that enable the beneficiaries to function as economies and social change agents in society, but also to impart values, ideas, attitude and aspirations important for national development (Nsubuga, 2003). According to Boit, Njoki and Chang'ach (2012), the purpose of education is to equip the citizenry with the ability to reshape the society and eliminate inequality.

Thakur and Thakur (2004) stated that secondary school leadership is a major determining factor of the quality of education and school performance. Leadership is essential in improving school management and raising standards of education. The quality of education depends on the nature of leadership provided by the school principal, his/her ability to control, direct and guide teachers and students. The quality of leadership also plays a vital role in students' achievement as it is concerned with teachers, pupils, rules, regulations and policies that govern the school (Buhere, 2007).

Recent policy discussions in the United States of America (USA) and elsewhere suggests that there is broad support for expanding teachers' participation in leadership and decision-making tasks besides the principals (Huber, 2004). These discussions are supported by research suggesting that increased teacher participation in schools has the potential for significant positive effects on school improvement including students academic achievement (Huber, 2004; Leithwood & Beatty, 2007; Leithwood *et al.,* 2008; Matthews & Sammons, 2005; Riley & McBeath, 2003). Studies on leadership have focused at principals when it should be on the classroom teachers. Teachers play a key role in the delivery of quality instruction. Their

responsibilities include ensuring educational strategies are in place that support effective learning for all students (Wango, 2009). They serve as a facilitator, guide and provider of quality instruction (Bakhda, 2006). Good subject teachers understand that quality instruction is essential for improving students' academic achievement.

In Chile, for instance, teachers are rewarded collectively when they work in schools which are identified as high-performing by the National Performance Evaluation System of Subsidized Schools (Organization for Economic Cooperation and Development, 2005). In Jamaica and many other developing countries, issues such as a lack of parental guidance, poor attendance, adolescent pregnancy, poor societal mentorship, inadequate living and school environments, health issues, inequality in schools, and domestic abuse affect not only students' learning but also leaders' efforts to influence academic performance (James, Mann, & Creasy, 2007; Miller, 2006; Townsend, 2010). Effective school leadership is essential to students' academic achievement (Townsend, 2010). School leaders must have excellent core knowledge, recognize effective instructional strategies, and understand content pedagogy and classroom management so that they can influence students' lives in positive ways (Farr, 2011).

School leadership, classroom management, and the delivery of instruction are the most important factors in student learning. Teachers need initial and continuing professional development to have a positive impact on student learning (Marino, 2007). Similarly, Stewart (2011) asserted that regular professional development can facilitate the emergence of leaders within the school system. Leaders who emerge from within the ranks of teachers make schools places where teachers learn, students

achieve, and leadership is distributed to advance management and leadership responsibilities (Farr, 2011; Spillane, 2005, 2006). It has been proved that teachers have an important influence on students' academic achievement. They play a crucial role in educational attainment because the teacher is ultimately responsible for translating policy into action and principles based on practice during interaction with the students (Afe, 2001).

Teachers stand in the interface of the transmission of knowledge, values and skills in the learning process. If the teacher is ineffective, students under the teacher's tutelage will achieve inadequate progress academically. This is regardless of how similar or different the students are in terms of individual potential in academic achievement. According to Rivkin, Hanusheck and Kain (2005), there has never been consensus on the specific teacher factors that influence students' academic achievement. Researchers have examined the influence of teacher characteristics such as gender, educational qualifications and teaching experience on students' academic achievement with varied findings.

Success in certain endeavours may be contingent upon certain factors. This may also be true of achievement in schooling. Good achievement in schooling could be the partial contributions of an individuals gender sensitivity, cognitive, affective (attitude) and psychomotor domains (Bogonko,1994). Adodo (2007) argued that one key overriding factor for the success of students' academic achievement is the teacher. In the same vein, Ibrahim (2000) believed that teachers' qualifications and exposure can go a long way to bring about pupils' high academic achievement. It is probably for this reason, Ibukun (2009) asserted that no education system can rise above the

quality of its teachers. Considering the assertions of Ibrahim (2000), Adodo (2007), and Ibukun (2009), it implies that teachers' role in the preparation of students to succeed in examinations cannot be underestimated.

Usman (2003) argued that shortage of qualified teachers is responsible for the poor academic achievement observable among the students while Ademulegun (2001) argued that students taught by more qualified and experienced teachers in terms of knowledge of the subject matter perform better than those taught by less qualified but experienced teachers. The educational analysis recently carried out in Nigeria by the National Economic Empowerment and Development Strategy (NEEDS, 2005) indicated that more than forty nine percent (49%) of the teachers in Nigeria are unqualified. This revealed the quality of teachers teaching various school subjects in the secondary school was low.

Akiri and Ugborugbo (2008) found that there was a significant relationship between teachers' gender and students' academic achievement. Yala and Wanjohi (2011) and Adeyemi (2010) found that teachers' experience and educational qualifications were the prime predictors of students' academic achievement. However, Ravkin *et al.,* (2005) found that teachers' teaching experience and educational qualifications were not significantly related to students' achievement. Etsy (2005) study in Ghana found that the teacher factors that significantly contributed to low academic achievement were incidences of lateness to school, incidences of absenteeism, and inability to complete the syllabi. Oredein and Oloyede (2007) concluded that teacher management of homework and assignments given to students have an impact on

student achievement especially when it is well explained, motivational, corrected and reviewed during class time and used as an occasion for feedback to students.

Studies have also shown that teachers experience exerts a great influence on the academic achievement of students. Ilugbusi, Falola and Daramola (2007) showed that teaching experience in schools count significantly in the determination of students' achievement in external examinations such as West Africa Senior School Certificate Examination (SSCE), National Examination Council (NECO), National Business and Technical Education Examinations and the Unified tertiary Matriculation Examination. According to them, inexperienced teachers are easily upset and destabilized by unfamiliar situations. This may imply that inexperienced teachers could get confused, mixed up the content of the topics taught to the students and hence the students will receive wrong information which would definitely lead to poor achievement among the students, while the experienced teachers are already immune to classroom provocative situations and have developed resistance and several solutions against classroom confusion inducing agents.

In Kenya teachers who excel in their teaching subjects are rewarded during open education day held annually in every district. While appreciating the value of rewarding teachers who produce better results, teachers should also not escape a portion of blame when students perform poorly. Odhiambo (2005) contends that there is a growing demand from the Kenyan government and the public for teacher accountability. Schools are commonly evaluated using students' achievement data (Heck, 2009). Teachers cannot be dissociated from the schools they teach and academic results of schools. It would therefore be logical to use standardized students'

assessments results as the basis for judging the performance of teachers. Teachers celebrate and are rewarded when their schools and teaching subjects are highly ranked (Kosgei, 2013).

In Kenya secondary education is regarded as the most important stage in the educational cycle of a child. It is the level at which learners are expected to acquire proficiency in both academic and applied subjects (Government of Kenya, 2005). Secondary school education is important because it is the foundation for further education, training and work (Koech, 2006). It is expected to provide holistic education which covers mental, social, moral and spiritual development and ensure balanced development in cognitive, psycho-motor and affective skills of students. Secondary education is expected to lead to acquisition of positive attitude, self-respect, self-reliance, cooperation, adaptability, sense of purpose, integrity and self-discipline, respect and consideration for others, service to family, society and nation (Bogonko, 1994).

The main mode of assessing whether secondary school education has achieved its objectives is through assessment. Students are evaluated throughout the four year cycle using class assignment, continuous assessment and termly tests to determine the progress of each student (UNESCO, 2006). At the end of the fourth year of secondary education, students sit for a national examination administered by the Kenya National Examination Council (KNEC) that leads to award of Kenya Certificate of Secondary Education (KCSE). The examination is used for certification purposes and selection of students for universities courses or training in post-secondary institutions (GOK,

2005). The examination thus ushers students to higher education training or direct entry into the world of work (UNESCO, 2006).

Students' achievement in the KCSE at the national level has been poor over the years. For instance, data from the KNEC indicate that in 2008 a total of 262,669 candidates sat for the Kenya Certificate of Secondary Education (KCSE) examinations, out of this number, only a small percent (29%) got grade C+ and above and thus qualified to pursue university education. Most of the candidates (71%) performed poorly as they got grade C and below and hence did not meet the minimum university entry requirement (MOE, 2010). There was a slight improvement in (2010) because out of the 307171 candidates who sat for the KCSE, 97,134 (32%) obtained C+ and above and 201037 (68%) got grade C and below (Siringi, 2011). Students's achievement in KCSE in Baringo county has also not been good over the years. For example, in 2012, a total of 6136 candidates sat for the KCSE examination. Out of this number, 1900 (30%) obtained C+ and above while 4,236 (70%) got C and below (CDE Baringo, 2013). A summary of students performance in the county for the years 2010 to 2013 is given in table 1.1

Table 1.1

Students' Performance in KCSE in Baringo County for years 2010 to 2013

Year	Registered candidates	Mean Score
2013	7012	5.27
2012	6018	5.51
2011	5636	5.66
2010	4098	5.48

The data in Table 1.1 reveal that the number of students registered for KCSE has significantly increased from 4098 in 2010 to 7012 in 2013. The students mean score

has been not only low (given that the maximum is 12) but also stagnant. According to Eshiwani (1993) low academic achievement leads to undesirable wastage through dropouts and repetition. It also denies students the opportunity to continue with schooling through the formal education system. Further, it jeopardizes students' opportunities for future job placement and reduces their chances of meaningfully participating in national development (Buhere, 2007).

Literature reveals that academic achievement is dependent on many factors among these are; resources, teaching methods, teacher factors, leadership and motivation (Glewwe, Kremer & Moulin, 2008 and Dessarollo, 2008). Dossett and Munoz (2003) pointed out that students academic achievement is influenced by three major factors; school-related factors, student-related factors and teacher-related factors. Goldhaber (2004) observed that the most important factors that contribute to students' academic achievement are teacher related factors. Wanjohi and Yala (2011), Oredem and Oloyede (2007) noted out that teacher related factors such as qualification, experience, instructional leadership, attitude, commitment to work and ability to cover the syllabus and management of students; homework and assignments were key determinants of academic achievement. This study focused on the relationship between teacher factors in particular; instructional leadership, qualification, experience, and attitude towards teaching and student academic achievement. The selection of these factors is informed by the influence they have on academic achievement.

1.3 Statement of the Problem

Secondary education is the basic requirement for selection into tertiary institutions and further skills training (MOE, 2005). Adeyemi (2010), observes that achievement is positively influenced by teachers qualification and experience while Akiri and Ugborugbo (2008) noted it was affected by teachers' marital status. Considering that teachers play a major role in the teaching and learning process, there was need to examine teacher related factors that influence academic achievement. It is possible that teacher factors may be the cause of low academic achievement of students in Baringo county.

Secondary school students' academic achievement in Baringo has been low despite the infrastructural, material and technical support from the government and other development partners. For example, in 2009 majority (72%) of the students in the county, scored below C+ grade in KCSE. Only (28%) of the students who sat for KCSE qualified for admission for a degree programme in that year given that the minimum qualification for admission to a public university is C+ grade (DEO Baringo 2010). This dismal performance is of concern to parents, the government and the general public because they expect good results from the students after investing heavily in secondary school education.

The poor performance of secondary schools in Baringo County undermines students' chances of joining institutions of higher learning and jeopardizes opportunity for job placement, and in most cases reduces an individual's active participation in national development. There is little if any empirical evidence relating teacher factors and

academic achievement of students in Baringo County, hence the need for the study. This study therefore sought to analyze the relationship between selected teachers' factors relationship between selected teacher factors namely; instructional leadership, teachers' qualification, experience and attitude on students' academic achievement in public secondary school in Baringo County.

1.4 Purpose of the Study

The purpose of the study was to examine the relationship between selected teacher factors namely; instructional leadership, teachers' qualification, experience, and attitude towards teaching in relation to students' academic achievement in public secondary school in Baringo County. This study was informed by the low academic achievement of students in public secondary schools in Baringo County, where majority of students scored below C+ grade in KCSE.

1.5 Objectives of the Study

The specific objectives of the study were:

i) To assess the relationship between teachers instructional leadership and students' academic achievement.
ii) To establish the relationship between teachers' qualification and students' academic achievement.
iii) To determine the relationship between teachers experience and students academic achievement.
iv) To determine the relationship between teachers attitude towards teaching and students academic achievement.

1.6 Hypotheses

The following hypotheses were tested:

Ho1: There is no statistically significant relationship between teachers instructional leadership and student academic achievement.

Ho2: There is no statistically significant relationship between teacher qualification and student academic achievement.

Ho3: There is no statistically significant relationship between teacher experience and student academic achievement.

Ho4: There no statistically significant relationship between teachers' attitude towards teaching and students' academic achievement.

1.7 Significance of the Study

The findings of the study may provide education stakeholders with an insight of how teachers' characteristics; instructional leadership, teaching experience, qualifications, and attitude contribute towards students' academic achievements. The significance of the study is that it will help to determine the influence of principals and teachers school leadership practices on classroom management, school environment, and academic underperformance. Leadership will support strategies and practices that enhance learning and teaching.

Insights from the study might lead to a new leadership role for school principals and teachers; the development of new teaching techniques like the use of information technology (ICT) in class lesson presentation and recommendations for the implementation of distributed leadership to improve school management, culture, vision, and performance. The findings may assist policymakers to developing intervention programs that promote teachers who could enhance students' achievement. The research findings may help school administrators come up with

effective strategies that enhance their academic achievement. It may also provide relevant information for future researchers.

1.8 Justification of the Study

The vital role played by secondary education explain the Kenyan government decision to introduce free tuition in public secondary schools in order to increase its demand (Ohba, 2009). Provision of quality secondary education is therefore important in generating the opportunities and benefits of social and economic development (Onsumu, Muthaka, Ngware & Kosembei, 2006). Lewin, Wasanga and Somerset (2011) reports that the academic achievement of students at secondary school level is not only a pointer of the effectiveness of schools but also a major determinant of the well-being of youths in particular and the nation in general. Yusuf and Adigun (2010); Lydiah and Nasongo (2009) noted that the performance of students in any academic task has always been of special interest to the government, educators, parents and society at large.

Wanjohi and Yala (2011), Oredem and Oloyede (2007) notes that teacher related factors such as qualification, experience, instructional leadership, attitude, commitment to work and ability to cover the syllabus and management of students; homework and assignments were key determinants of academic achievement. The quality of education in most countries is measured in in terms of students achievement in national examinations. Public examinations are important as they are used for certification, selection of students or training and job placement (Hill 2010). Students academic performance in Baringo has been poor over the years despite the fact that the schools in the county have adequate number of teachers, the infrastructural,

teaching-learning material and technical support from the government and other development partners within the county (CDE, Baringo, 2013).

The study focused on Baringo county because of dismal performances witnessed in last two years compared to neighbouring counties Elgeyo Marakwet and Uasin Gishu. For instance, Elgeyo Marakwet was ranked number 3 in 2012 and 3 in 2013 and Uasin Gishu ranked number 9 and 10 respectively of out of forty seven counties in Kenya, while Baringo was ranked 24 and 17 in counties order of KCSE merit in the same years (Ndungu, 2014). The schools in these three counties admitted students with similar environmental conditions and entry behaviours, yet performances differed. Most of the students in secondary schools in Baringo County fail to progress in their education and this adversely affect their future. If such a trend is replicated in other counties, Kenya may not be able meet their human resources needs required by her Vision 2030 programme (NESC 2007). Perhaps the dismal performance may be due to teachers factors thus the need for the investigation.

1.9 Scope of the Study

The study sought to establish the relationship between teachers' related factors and students' academic achievement. The study was conducted in Baringo County among the public secondary schools. This was achieved through determining the relationship between teacher factors namely; instructional leadership, teachers'qualification, experience and attitude and student achievement. The study was guided by the Education Production Function Model. The study adopted postpositivists paradigm . The respondents of the research were teachers only. Simple random sampling was

used to select teachers. The questionnaires were used to collect the data. The respondents were teachers only.

1.10 Limitations of the Study

The study was limited to sampled secondary schools in Baringo County of Kenya, since the region covers an expansive area that could not allow selection of all schools. It was hoped that the information obtained from the sampled schools is a representative and may be generalized to other parts of the country. Sampling was used to select representative samples. The study was limited by the fact that some respondents were hesitant to conduct their self assessment and gave honesty responses. This was overcomed by targeting more respondents to obtain reliable responses.

The study relied on questionnaires, which was self-assessment measure for secondary school teachers and it was not possible to check the genuineness of their responses. Reliance on self report was problematic and may threaten the validity of the findings. Triangulation of the research methods instruments helped overcome these limitations by ensuring that the sampling was representative.

1.11 Assumptions of the Study

The following assumptions were made during the study;

i. The respondent were honest and true information when filling the questionnaire.
ii. That the respondents were conversant with factors affecting low academic achievement of students in public secondary schools.

1.12 Theoretical Framework

The researcher adopted an Education Production Function to explore the link between teachers' inputs and students' academic achievement in secondary school. Greenwald, Hedges and Laine (1996) contend that Production Function is an important model which researchers and policymakers have used for over 20 years to analyse the impact of educational resources on student academic achievement. The Education Production Function Model provided the theoretical framework that informed this study. Production Function is the process that transforms inputs into outputs. Inputs that go into Education Production process are for example students, teachers, books, fees and school facilities, non-teaching staff and catering and accommodation services.

Monk (1994) discusses how researchers and policymakers have measured the influence of school characteristics, teacher characteristics, facilities, and student characteristics on students' academic achievement using the Production Function. He contends that the Production Function includes a wide range of areas that encompass educational production studies. For Monk (1994), educational inputs include school characteristics, teacher-related variables, facilities and students' characteristics. Greenwald *et al.*, (1996) define outcomes as achievement as measured by standardised tests, future educational patterns and adult learning.

The literature thus suggests that the standard Production Function Model is always expressed as an equation, Y = f (T, P, and S), where Y represents the educational outcomes variable (dependent variable), T represents teachers' inputs (independent variable), P represents school characteristics (independent variable), and S represents students' characteristics (independent variable). Since the purpose of the current

study was to determine the impact of teachers' inputs on students' academic achievement, it was opted to drop P and S in the equation and adopt a process-product model instead. A process-product approach uses teachers' inputs as the independent variable and students' academic achievement as the dependent variable. In order to understand the extent to which the teacher inputs correlate with students' academic achievement, focus was on empirical studies that link teachers' inputs with students' academic achievement at secondary school level.

Krueger (2003) asserts that different combination of inputs yield a given level of output. Hence the Production Function describes a relationship showing the amount of output capable of being produced by each and every set of specified inputs. Education in the context of this theory is viewed as a productive activity that combines various inputs from administrators, teachers factors and resources such as finances, teaching-learning materials to transform the enrolled students into graduates with good grades in national examinations (output).

Adeyemi (2008) argued that the education system is a productive system that has outputs. The outputs are generally defined in terms of students' test scores which denote academic achievement and that the components of an education system could be represented in an input-process-output model (Worthington, 2001). According to Wobmann (2004), student achievement is produced by several inputs in the educational process. Such inputs include but are not limited to student's family background characteristics, class size, availability of teaching and learning materials, and teacher characteristics. The teacher as an input is the principal factor in education provision and thus affects the quality of education in a significant way. The vital role played by secondary education may partly explain the Kenyan government decision to

introduce free tuition in public secondary schools inorder to increase its demand (Ohba, 2009).

Provision of quality secondary education is therefore important in generating the opportunities and benefits of social and economic development (Onsumu, Muthaka, Ngware & Kosembei, 2006). The production function model identifies teachers factors as some of the inputs in a school system that influence the outputs. One of the outputs in Kenyan secondary schools system are grades in national examinations. A number of studies have found a significantly positive effects on student academic achievement for inputs such as teacher experience, teacher training, facility quality, textbook use, and instruction time (Kosgei *et al*, 2013).

According to Ankomah, Koomson, Busn and Oduro (2005), teacher factors that have an effect on academic achievement include the number of teachers on post, teacher pupil ratio, teacher qualifications and the personal characteristics of the individual teacher. The personal characteristics include academic qualifications, pedagogical training, content training, aptitude, and years of service/experience. A teacher brings these characteristics to class to facilitate the learning process. The extent to which other inputs can improve the quality of education is directly related to the extent to which teachers effectively use the inputs to improve the teaching and learning process.

According to Sifuna and Sawamura (2010), the process of quality is therefore the quality of the teacher-pupil interaction in the teaching learning process. The theory highlights relationship between teachers factors such as a instructional leadership,

qualification, experience and attitude towards teaching and students academic performance and hence the theory was found suitable for this study. This study therefore sought to investigate the influence of selected teacher characteristics on the academic achievement of secondary schools in Baringo County.

1.13 Conceptual Framework

The study conceptualized the relationship between dependent and independent variables. The teachers' qualification, experience and attitude towards teaching and instructional leadership were the independent variables, while student's academic achievement was the dependent variable. The intervening variable is the government policy guiding the teachers instructions. The intervening variables affect the outcome of the study hence controlled through sampling, only the study involved public county schools. The study variables and how they interact was shown in Figure 1.

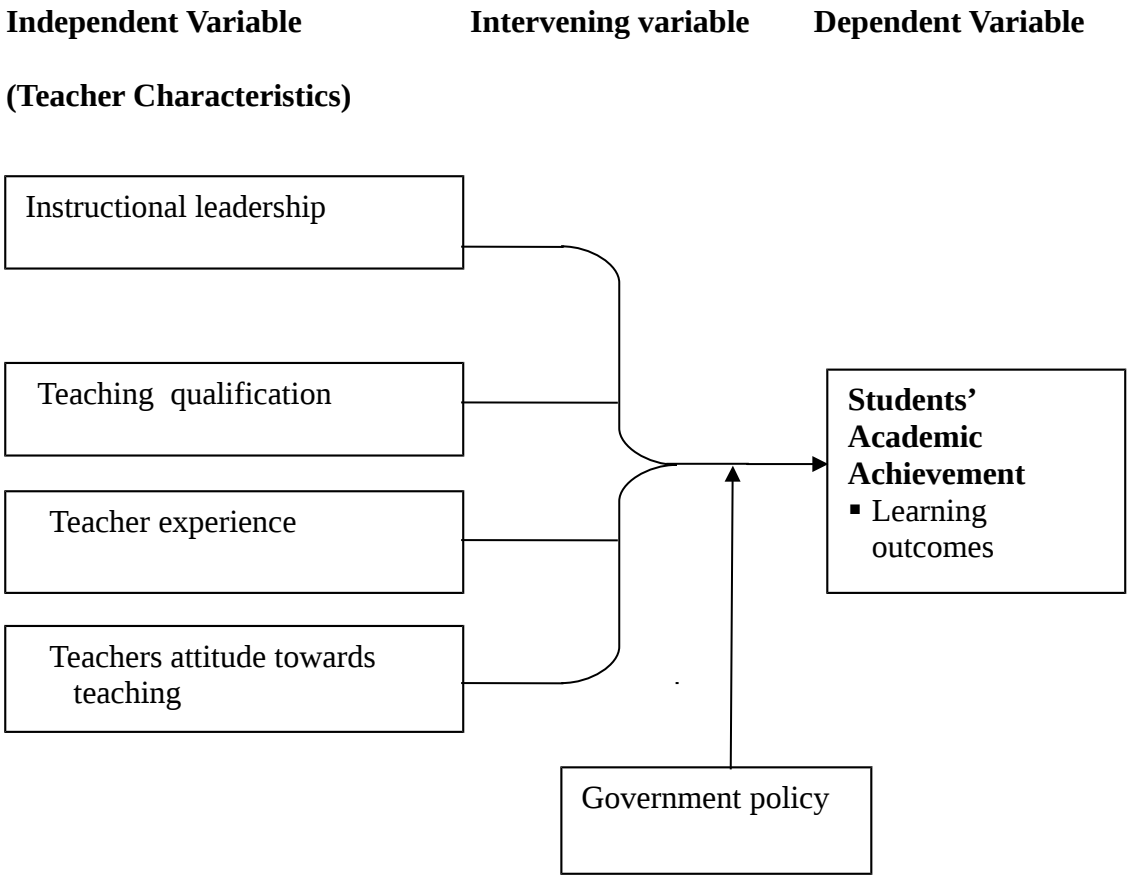


Figure 1: Conceptual framework

The effects of the intervening variables was further minimized through randomization during sampling of schools from various sub-counties in Baringo county. The conceptual framework derived from Educational Production theory focuses only on teacher factors and student achievement. It has been recommended as one of the best methods of minimizing the effects of intervening variables (Best & Khan, 2006). Randomization ensured that any association between instructional leadership, teachers' qualification, experience and attitude towards teaching and students' academic achievement was not attributed to chance.

1.14 Operational Definition of Terms

The operational definitions of the major terms were given in this section

Academic Achievement - This refers to the basic premium upon which all teaching-learning activities are measured using some criteria of merit (Aremu, 2001). In this study it was measured by mean grades obtained in KCSE examinations

Attitude - This refers to an expression of favor or disfavor toward a person, place, thing, or event (Wood, 2000). In this study it means teachers' deposition towards teaching.

Correlation – This refers to a mutual relationship or connection between two or more things (Wood, 2000). In this study it referred to the relationship between teacher factors and student academic achievement.

Experience -The term refers to knowledge of or skill of some thing or some event gained through involvement in or exposure to that thing or event **(**Stephanie, 2005**).** In this study it refers to the knowledge and skills acquired after a number of years in teaching.

Instructional Leadership- It can be defined as an act or instance of guiding or directing a group to achieve certain specified goals, (Richard D, 2002). In this study, it referred to those activities of subject teachers and teachers that directly affected teaching and learning and students academic achievement in schools

Qualification -This referred to the highest educational level obtained by a teacher. Secondary school teachers in Kenya are required to have minimum of a bachelor's degree or a diploma under exceptional cases (TSC 2011).

Teacher Characteristics: Qualities of a teacher which include academic qualification, experience, instructional leadership and attitude towards teaching (Stumbo&Mc Walter, 2010).

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This chapter presented a review of literature on relationship between selected teacher factors and students' academic achievement. The review covered relationships between teachers instructional leadership, qualification, experience, attitude towards teaching and students academic achievement and summary of literature and gap therein.

2.2 Academic Achievement

According to Adediwura and Tayo (2007), academic achievement is designated by test and examination scores or marks assigned by the subject teachers. It could also be said to be any expression used to represent students' scholastic standing. Lewin, Wasanga and Somerset (2011) reported that the academic achievement of students at secondary school level is not only a pointer of the effectiveness of schools but also a major determinant of the well-being of youths in particular and the nation in general. Yusuf and Adigun (2010), Lydiah and Nasongo (2009) noted that the performance of students in any academic task has always been of special interest to the government, educators, parents and society at large.

Odhiambo (2005) contends that there is a growing demand from the Kenyan government and the public for teacher accountability. Schools are commonly evaluated using students' achievement data (Heck, 2009). Teachers cannot be dissociated from the schools they teach and academic results of schools. In identifying which teacher factor has positive impact on students learning outcomes is a worth -while exercise because a poor academic performance is common among secondary

school students. In many countries including Kenya, the qualities of effective teaching have been investigated by several scholars and are fairly well known for example, Tucker and Hindman (2004) reported that effective teachers are knowledgeable in their subjects, caring towards their students, fair and respectful to students, have positive attitude towards teaching as profession, are responsible in class and are motivating to the learners. Adodo (2007) argued that key overriding factor for the success of students academic achievement is the teacher.

Ferguson (1990) defined academic achievement as the quality and quantity of knowledge, skills, grades, techniques and positive attitude, behavior and philosophy that learners achieve or acquire. This ability is evaluated by the marks and grades that the students attain in a test or examination which is done at the end of atopic, school term, year or education cycle. The scores and grades that each student obtains measure the degree of achievement. The quality of the grade and the number of candidates who pass in various grades determines the level of academic performances in a given period in a particular examination, be it internal or public (Ferguson 1990).

Academic achievement is commonly measured by examinations or continuous assessment but students are also evaluated throughout the course with continuous assessment to determine the progress each student is making (UNESCO, 2006). At the end of the fourth year of secondary education, students sit for an examination administered by the Kenya National Examination Council (KNEC) leading to the Kenya Certificate of Secondary Education (KCSE). Research shows that students' academic achievement is influenced by several factors, among these are; intelligence of students, anxiety level, motivation, discipline, vocational goals, home environment,

learning facilities in schools, teachers' qualifications and nature of tests (Chepchieng & Kiboss, 2004).

Students' achievement in tests and examinations is also affected by the extent to which a student has covered the topics that are being examined, attends all classes, actively participates in class, completes assignment on time, amount of teaching and academic emphasis, teacher expectation and school climate (Muriithi,2007). Literature further reveals that there is a close association between instruction leadership and academic achievement this is supported by (Ross & Gray ,2006) who noted that schools with higher levels of transformational leadership had higher collective teacher efficacy, greater teacher commitment to school mission, school community and school-community partnerships, and higher student achievement.

2.3 Concept of Teacher Characteristics

The term "teacher characteristics" can be referred to as qualities that can be measured with tests or derived from their academic or professional records (Ashton, 1996). They indicate that teacher characteristics does not generally refer to the direct observation of their influence on students' learning in terms of either students' test performance or teaching behaviors. Rather, the approaches dealt within the scope of this research are those that fall traditionally into the province of personnel psychology or personnel selection. This review deals with those characteristics of teachers that might be identified and used in the initial hiring of teachers to increase their students' achievement. Teacher characteristics refer to attitude and attributes that teachers bring with them when they enter the classroom such as expectations for students, collegiality or collaborative nature, race and gender (Ballou & Podgursky, 2000).

Teacher effectiveness on the other hand refer to a value added assessment of the degree to which teachers who are already in the classroom contribute to their students' learning, as indicated by higher than predicted increases in student achievement scores.

Ashton (1996) indicates that these characteristics could include qualities of teachers that are viewed as personal – such as mental ability, age, gender – or as "experiential" – such as certification status, educational background, previous teaching experience and the like. Some characteristics are combinations – in unknown amounts – of personal and experiential qualities, for example; candidates' performance on teacher-certification tests such as the national teacher examinations and state-mandated tests. Teachers, however, have a direct responsibility to shape a student's academic achievement, and are the most important school-based factor in their education (e.g. Rockoff 2004; Rivkin, Hanushek and Kain 2005; Aaronson, Barrow and Sander 2007). This is why it is important to examine which teacher characteristics may be related to student achievement.

Because of increased emphasis on high stakes testing, teacher characteristics have traditionally been measured through student outcomes such as test scores (Stumbo & Mc Walters, 2010). According to Ndebbio (2000), formal education is result-evaluation oriented and as such every learner needs to achieve goals in life because of social approval of success or punishment for failure. Maximization of returns on investment and achieving the best results are the concern of all stakeholders in education. There is need to assess some teacher characteristics and their contributions to student academic achievement. In view of these conflicting findings and views, this

study investigated the relationship between selected teacher characteristics and student academic achievement in Baringo County, Kenya. According to Ministry of Education Science and Technology (MOEST), it is logical to use standardized students' assessment results as the basis for judging performance of teachers (MOEST, 2002). Kenya Certificate of Secondary Education (KCSE) result of 2013 candidates was used to analyze academic achievement of students and therefore the contribution of teachers.

2.3.1 Global and Regional Perspective of Teacher Factors Influencing Student's Achievement

Studies on incentives and academic achievement in New York City Public Schools concluded that there is no evidence that teacher incentives increased student performance, attendance or graduation (Fryer, 2011). If anything, teacher incentives may decrease student achievement especially in larger schools. Studies in US by the year 2000 showed that there was positive correlation between student test scores and financial incentives systems that reward individual teachers (Figilio & Kenny, 2011). According to Woesmann (2010), the use of teacher salary adjustments for outstanding performances is significantly associated with Science, Mathematics and reading achievement across countries. Countries with performance- related pay are about one quarter standard deviations higher. Muriladharan and Sundaravaman (2011) investigated the effect of individual and group incentives in 300 schools in Pradesh, India, and found that individuals and group incentives increased student achievement in both language and mathematics.

Studies in Canada Schools opined that in order to improve quality of education in Canada, teachers should be paid according to the academic success of their students

instead of the number of years they have been teaching (Clifton, 2013). These studies showed that teachers with more education and more experienced are paid more than teachers with less education and less experience, even if they are doing the same job and even if the lower paid teacher is more effective in the classroom There is a growing demand from Kenyan government, educators, parents and public for teacher accountability. Teachers cannot be disassociated from schools they teach and academic results of schools (Heck, 2009; Lydia & Nasongo, 2009; Yusuf & Adegun, 2010). Winters, Ritter, Mash, Holley and Greene (2008) put it that there is need for understanding of the impact of teacher effort in the educational production process.

Kimani *et al*., (2013) observes that student achievement is produced by several inputs in the process. The inputs include but not limited to family background characteristics, class size, teaching and learning materials and teacher characteristics among others. The teacher as an input is the principle factor in education provision and thus affects the quality of education in a significant way. Teacher factors have an effect on academic achievement and examination results depend on the extent to which teachers effectively use the inputs to improve teaching and learning process. Every school has a different mix of teacher experience, education, teacher attendance, and student-teacher ratio, among other readily available measures. Considering which teacher characteristics produce the best student achievement at the school level can help the school in identifying unique ways to increase student achievement with the teacher resources available to them.

According to data obtained from students in North Carolina by Jackson (2010) teacher effectiveness is higher after a transfer to a different school and teacher-school

matching can explain a non- negligible part of teacher quality. Boyd, Lankford, Loeb, Ronfeldt and Wyckoff (2010) found that teachers whose students demonstrate higher achievement growth are less likely to transfer to another school. Thus a better school job matching may potentially increase productivity and student achievement in their former and new school.

According to Fenech (2006), satisfaction at work may influence various aspects of work such as efficiency, productivity, absenteeism, turnovers rates and intention to quit and that employees including qualified educational staff well-being has serious implications for the quality of the education they provide. Satisfied teachers are expected to hold their jobs longer to be able to engage in more responsive, positive and consistent interaction with student and to positively influence students performance.

Extrinsic incentives such as merit pay or effectiveness among the Nigerian teachers exists (Ubom, 2001). The extrinsic factors evolve from the working environment while the actual satisfiers are intrinsic and encourage a greater effectiveness by designing and developing teachers higher level needs. The issues of motivation of teachers in education and the impact on academic performance are considered as an important aspect of effective learning. However, a learner's reaction to education determines the extent to which he or she will go in education. A study of teacher absenteeism carried out in 2004 in Uganda found an average rate of teacher absenteeism of 27 percent considerably high than most countries. The government conducted impromptu visits to 160 government/ non government schools in Uganda in 2006. The schools where randomly selected across three regions (Western, Eastern,

Central) six districts the rate of teacher absenteeism was found to be 23% (Habyarimana, 2007)

According to Darling-Hammond, (1998) report based on three countries, Zambia, Papua &New Guinea on value of teachers there is a potential crisis in the teaching profession that threatens the ability of national government to reach internationally agreed targets to expand and improve education. In many developing countries the teaching force is demoralized and fractured. The report focuses on factors in four areas conditions of the level of teachers, the situation as educators, the relationship with their local community and their voice in educational policy. This report concludes that teachers poor payment adversely affects their status in the society hence poor performance. Eisy (2005) study in Ghana found that the teacher factors which significantly contributed to low academic achievement were incidences of lateness to school, absenteeism and inability to complete the syllabus thus affecting students performance in national examinations.

For many years, educators, administrators or managers, researchers have debated over which variables influence student's academic performance. A growing body of evidence suggests that schools can make a great difference in terms of students' academic performance and a substantial portion of that difference is attributable to teachers. Specifically differential teacher effectiveness is a strong determinant of difference in students' learning, far outweighing the effects of differences in class size and class heterogeneity. Students who are assigned to one ineffective teacher after another have significantly lower achievement and learning than those who are assigned to a sequence of several highly effective teachers. Thus

the impact of teachers' effectiveness or ineffectiveness seems to be additive and cumulative. Which factors then contribute to teacher effectiveness?

Certainly, there has been a convergence of the available research data pertaining to this question over the past years. Some of these factors fall under the general heading of teacher behavioural traits. Teacher behavioural traits are relatively stable traits that are related to and influence the way teachers practice their profession (UNESCO, 2004). Several of these traits have also been identified by other researches. Commitment and drive for improvement, for example, combine to form what Slavin (1995) referred to as relentlessness and what Andersen and Pellicer (1998) termed zero tolerance for failure.

Despite differences in nomenclature, the teacher behavioural traits have been found to be related to teacher effectiveness and students academic performances in a variety of settings by a variety of researchers. It is important to note however, that the influence of teacher behavioural traits on teacher's effectiveness and students academic performances is not direct, rather it is moderated or mediated by their effects on the way in which teachers organize their classrooms and operate within them.

Teachers influences what students do and also influence what and how much students learn (UNESCO 2004). So effective teachers must posses the knowledge and skills needed to attain the goals and be able to use that knowledge and those skills appropriately if these goals are to be achieved. The possession of knowledge and skills fall under the heading teacher competence while the use of knowledge and skills in the classroom is referred to as teacher performance /productivity. Thus there

should be a link between teacher behavioural traits, teacher competence and teacher productivity and students' academic performances.

Educational system at every level depends heavily on teachers for the execution of its programmes. Obadara (2005) viewed teachers to be highly essential for a successful operation of the educational system and as a key to the educational development. Without teachers with relevant behavioural traits, educational facilities cannot be used to facilitate academic performance of students. Undoubtedly the success and quality of any educational system depend on the quality of teachers input into the system. Akanbi (2005) noted that it is a known fact that schools must have teaching and non-teaching personnel's. The question that arises is, what traits do the personnel's employed possess? The educational administrator by his position either in the ministry or in privately owned schools must equip the school with good and qualified teachers with relevant behavioural traits. The process of doing this according to him includes interview, test, recruitments, job analysis and record keeping. There must be training and development of academic staff.

Teacher training which includes on job training, workshops, seminars, among others aims at improving their competences, productivity and students' academic performances. Therefore school administration should ensure that good personnel policies are formulated and implemented appropriately in the school. Staff must also be motivated, this makes them devoted to work thus enhancing the chances of achieving the objectives of the school, education and the students. Many countries are in the midst of educational reform, with the heart of this reform revolving around changes in the curriculum and teacher instructional behaviour. Teachers play a central

role in bringing about the desired reform, as it is the teacher who implements the curriculum (Sandt, 2007).

The current state of education in developing nations like Nigeria does not allow anyone to have much confidence in the system. Problems such as inadequate infrastructure, brain drain, lack of motivation on the part of instructional and non-instructional staff, crowded classrooms, lack of instructional aids, lack of recreational facilities, high student/teacher ratio, inadequate training and development for staff and lack of data and statistics are encountered at all levels. All these have serious implication on teachers' delivery system in the classrooms and certainly have undesirable effects on students' academic performance. Teachers with relevant behavioural traits have been recognised as the hearth and most vital resources in the educational system since they are the ones who interpret the aims and goals of education and ensure that the students are educated in line with them.

Babayomi (1999) at the world Teachers' day noted that teachers are fully equipped to understand and communicate to both children and adults, the skills required to build more sustainable livelihood in a world in which technological change and globalization are continually changing the nature of work. High competence levels and recruitment criteria, career development, salaries comparable to other professionals with similar qualifications, appropriate class sizes and resources for effective teaching and learning are essential conditions for the educational quality that is universally sought. He identified the teacher with professional behavioural traits as the pivot of the educational process and the main determinant of the quality

and effectiveness of its result. So the supply of good teachers with right traits remains the bottleneck to improvement.

Odunusi (1999) stated that teachers with right traits are the hubs of any educational system upon their devotion and quality, the effectiveness of all educational arrangement must chiefly depend. Teachers have been and will always be the essential pillars of education. No matter how grandiose a school system and its curricula may be, the implementation of its programmes was fruitless unless competent and effective teachers handle them. Therefore, the ultimate realization of the aims of education and thus, the achievements of the country's needs depends on the qualitative and quantitative attributes and attitude of teachers in schools. In the classroom, a professional teacher must demonstrate excellence in his teaching. He must maximize his ability to transform the learners' positively in cognitive, affective and psychomotor areas. He must show superiority in his teaching process that is, what the teacher does, what the students do, the pattern of interaction among others.

Furthermore, the teacher must be intelligent, well qualified and must possess neat appearance, and desirable traits. In essence, an effective teacher is a teacher who consistently and rightly conducts a teaching learning interaction to the satisfactory achievement of desired (as well as the undesired but worthwhile) intent as well as the values of the process, the satisfaction of the interest groups based on professionally justifiable standards, ethnics and ideals with a measure of commendable creativity. Researchers have been able to estimate the overall contribution of teachers' behavioural traits to students' academic performances. This includes not only the effect of easily measured attributes such as demography and qualification

such as experience and degrees obtained but also the effect of harder to measure intangible attributes, such as teachers' attitude and skill in conveying knowledge.

Araoyinbo (1995) pointed out the important role that the sex of the teacher plays as a pervasive influence in classroom relationships among other things. He established that the teachers' sex has an effect on his perception of the students' aspirations and attitude and on his/her involvement in the job of teaching itself. He noted that, male teachers differ from female teachers in personality and social traits. The male teachers are much more emotionally stable and businesslike, but less friendly and responsible than their female counterparts. Other researchers have also confirmed that when these characteristics were present in a teachers Students' achievement would definitely be high.

Content based pedagogical knowledge (Sandt, 2007) can be described as practical knowledge of teaching. It includes knowledge of approaches to school topics, teachers' knowledge of teaching procedures such as effective strategies for planning classroom Practices, behavioural management techniques, classroom organizational procedures, motivational techniques, different ways of presenting facts. He described pedagogical knowledge of teachers as of special interest because it identifies the distinctive bodies of knowledge for teaching. lt 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. Pedagogical content knowledge is the category most likely to distinguish the understanding of the content specialist from that of the pedagogy.

Teachers therefore have been identified as the heart of the educational process and the main determinant of quality and effectiveness of its result. That the main bottleneck to improvement of students academic performances is recruitment of good and quality teachers. He noted that teacher's behaviour is not only influenced by their beliefs but also by their attitude towards teaching. And that attitude is defined as internal beliefs that influence personal action and is learned indirectly through one's experience and exposures. Teachers' attitude toward teaching include: Work value, teacher self-esteem, teachers' self-efficacy, teachers' expectation, teachers' commitment among others.

Attitude teachers hold regarding students could be attitude toward individual learners, groups or classes of learners. This could include liking (affection towards learners) enthusiasm to teach these specific learner(s). Teachers are more likely to exhibit more enthusiasm in preparation and presentation of lessons when they are affectionate towards learners than when they are apathetic or indifferent towards this student. These attitude towards students could be formed due to characteristics exhibited by the students (such as low socio-economic status, poor discipline, physical appearance or special educational needs e.g. speech difficulties (Dada & Alani, 2007) that teachers personally find acceptable or unacceptable or attractive or repulsive.

The validity of the hypothesis that, the work value held by individuals in an organization constitutes an intervening variable between performance and job satisfaction is no longer a matter of conjecture or debate. More so postulated that the extent and nature of job satisfaction experienced by a person on his/her job is a

function not only of the objective properties of the job but also of that person's motive or goals. In conformity with that view, the social action school of thought argue that the issue of job satisfaction cannot be meaningfully understood without knowledge of the meanings, which individuals give to their work. An employee's value system or teachers work value has been argued to be central to his motivational system, to his expectation of organizational rewards and ultimately to his job performance and satisfaction. These serve as reference points of behaviours on the job.

Work values differ from person to person and such variations in work values are said to be due to a number of variables such as socializations and other types of life experience which have been in existence prior to the person's taking up the job; non-work social role and the work experiences themselves (Ejiogu, 1992). Study by Ejiogu (1992) on teachers' work orientations, revealed that teacchers place higher values on the extrinsic reward of their jobs than on the intrinsic. The teachers, regardless of their variations in age, sex and qualifications placed the highest valuation on economic returns. They presented themselves as hedonistic and acquisitive creatures interested mostly in obtaining the greatest economic rewards. Certainly it would be sheer romanticism to expect the present day teachers in relatively deprived society such as Nigeria to work for a reward in heaven. The protestant ethic which emphasizes hard work as a sign of God's favour does not seem to appeal any longer to most of the modern employees, teachers inclusive.

It is crystal clear that the presence of financial and material resources alone cannot get things done except human beings are available with the necessary staff to make use of money and machine. In the school setting, goals and objectives are achieved through

the efforts of people, knowledge could be imparted if human resources are present even when material resources are not available or adequate. It also pertinent to say that teachers are indispensable human resources out of all the human resources in educational system.This is so because teachers interpret the aims and goals of education and ensure that the children are educated in accordance with them. Since quality output depends on quality input, the success and quality of any educational system depends on the quality of teachers input into the system (Obadara, 2005).

The concept of teachers' behavioural traits, teachers' productivity and students' academic performance are multi-dimensional. They involve an inter play of various elements in the work force. While the output may be related to miscellaneous resources or input, there are several productivity ratios, each of which is influenced by an array of relevant factors. These influencing factors include availability and quantity of materials or inputs, rate of capacity utilization, the scale of aspirations, the nature of equipment's, the attitude and skill level of the work force and motivation of the teachers interplaying with the effectiveness and efficiency of the management.

The way in which these elements interact has an important impact in the resulting productivity of the teachers' and, the academic performance of students. Thus the level of realization depends on him or teachers' performance and technical factors. These are moderated by managerial action such that it is only through an effective intervention of able management that the full benefit of either or both factors can be drawn out to enhance productivity of teachers' and students' academic performances (Ndu, 2002). There is therefore the need to identify and favorably modify all the factors and situations that prompt students' academic performance.

In this way, the colossal investments in education by both public and private sources will neither be a waste nor dreams for national development, otherwise qualitative education remains a mere wish (Ogunsola 1991). It thus appears that teachers' behavioural traits such as demographic traits, qualification, teaching process, teaching attitude and job satisfaction are important variables in teachers' productivity and students' academic performances. However, a critical examination of available literature revealed that previous researches despite their scope and perhaps depth only examined partially the relationship between demographic attributes of teachers as they relate to students leaning outcome which are extrinsic with utter disregard to intrinsic variables such as teachers' attitude and teachers' job satisfaction. For example in a study of a path-analytic study of some teacher characteristics and teacher job performance in secondary schools, the researcher concentrated more on demographic and qualification variables of the teacher.

More attention was given to teachers' qualification and demographic variables in other study titled school. Environment, teacher characteristics, and teaching process as factors of teachers' productivity in selected unity schools. The preceding literature review shows that none of the researchers studied the joint contributions of teacher behavioural traits such as demography, teaching process, teachers' attitude, job satisfaction and student's academic performance exhaustively. However there is need for comprehensive approach. It has also been observed that few researches have been devoted to exploring the influence of teacher behavioural traits on the students'

academic performance while those that even exist concentrate largely on demographic correlates as a major component in their studies.

The researcher also contends that the battery of predictor used to predict the student-academic performance in public secondary schools may be dissimilar in private secondary. The researcher therefore strongly contends that hardly any work exists that studies the joint Contributions of teachers behavioral traits-demography, teaching process , teaching attitude, job satisfaction, on students' academic performance in secondary schools exhaustively. The choice of southwestern geo-political zone of Nigeria is justified because the zone has the highest number of secondary schools both public and private. It therefore seems that this is one of the areas, which have not drawn much research interest in adequate measure in Nigeria.

A few researchers (Oluwole & Aremu, 2005) have shown interest in combined influence of intrinsic behavioural traits such as teacher work value, self-esteem, and job satisfaction and extrinsic teacher behavioral traits such as demographic traits on teachers' productivity and students' academic performance. Many studies attest that some teachers contribute more to their students' academic growth than other teachers. However, research has not been very successful at identifying the specific teacher traits and classroom practices that are most likely to improve students' learning. Unfortunately, this is just the information that educational policymakers need most. This justifies the desire to break this ground so as to extend the frontier of knowledge in order to help improve the unimpressive, teachers' behavioural traits, teachers productivity and students leaning outcomes and serves as the

motivating factor for undertaking the present piece of research so as to fill the-existing important research gap.

Ukeje (1970) expressed the prime importance of teacher qualification to the educational development of any nation. The researcher sees teacher as the centre of any academic programmes. That is good qualification of teachers' would lead to better performance of students and there is likely to be a link between pupils' performance and teacher effectiveness and between performance and classroom atmosphere. Adesina (1981) perceived the need for improving teacher qualification and according to him teaching experience determine students' achievement to a great extent. The teacher can greatly influence the performance of children since their remarks, interest, attitude and methodologies affect students' performance at school. Farrant (1980) believes that for a teacher to be efficient at his work, he should have a sound knowledge of all that the content, method and sequentially arrange work to meet the individual needs of his pupils, using the environment.

A teacher is required to transmit what is spelt out in the curriculum content. Therefore, the teacher becomes the basis from which desirable experiences are made available to learners. Hence, teachers' must make it necessary to avail themselves of the fundamentals that are required in teaching if their activities in the classroom was meaningful. Adebanjo (1999) found out that improper teaching methods affect students' performance and if a teacher does not know how to communicate properly or use proper channel of communication, the students are bound to learn the wrong thing. He also found out that improper

teaching methods and inadequate language of instruction tend to slow down the academic performance of the students. Moreover, Pierce and Lorber (1979) cited in Adebanjo (1999) emphasized the importance of varying teaching methods in order to stimulate and sustain interest as well as facilitate achievement of instructional objectives.

Adesina (1981) stated that teacher is required to give knowledge and train students the basic skills as stipulated in the curriculum and provide guidelines for effective teaching in class. That is to say in the school setting, the teacher and school curriculum are inseparable factors in ensuring success or failure of any intended learning outcome. Ekwuewe (2001) states that a well-planned curriculum is not guarantee that learning take place but for the teacher who is competent and a pupil who is reasonably motivated and ready to learn. An incompetent teacher can destroy any teaching programme. There is the need for emphasis on appropriate and adequate intellectual training of teacher in the interest of teachers in particular and students who are always at the receiving end.

Omosewo (1998) found that there is a significant difference in the performance of physics students taught by qualified teacher and those taught by unqualified teachers. The sample for her study constitutes fifteen physics teachers from Kaima and Moro Local government Areas of Kwara State, Nigeria. The qualifications of the teachers are B. Sc (Ed) physics (1 teacher) (NCE Math/Physics (10 teachers) and HND in Engineering (4 teachers). The education of the pupils is always the self-education of the teacher. In conclusion, it is the sole responsibility of the teacher to make sure that students gain the resources as stipulated in the school

curriculum. The extent to which a teacher will achieve depends largely on his/her academic competency in the subject. Hence, the teacher must try to make himself/herself worthy of his calling and fulfill the requirement for effective teaching.

The standard of education seems to be falling fast due to perceived low productivity of teachers, students and gross under-funding in secondary schools. This is due to poor performance of secondary school students in public examinations. Findings have supported the fact that certain teacher, school and home factors play a pact in determining students' academic performance through studies on teachers' variables, students and classroom variables singly or in combination so. as to enhance students academic performance have not yielded the expected significant result as evidenced in various yearly result analysis. The hue and cry about the students' academic performance in Secondary School Certificate Examination is becoming alarming. The degree of failure is giving the general public a serious concern. The expected quality has not been attained.

There is a persistent decline in the academic performance of Secondary School students in spite of government huge expenditure on education. However, instead of looking into the general and specific causes of decline, some, most of the time castigate the school related factors especially the teacher-related factors; knowing well that functional educational system depends on the adequacy of some indispensable teacher behavioural traits. So, there is a need to ascertain what teacher-variables influence the academic performance of secondary school students. It is

against this background that the as teachers' teaching attitude, teachers' teaching process) and students' academic performance among secondary school students.

For a teacher to be the 'Master' of his/her class, he has to be adequately informed of the content of the instruction he has to pass across to the students and must know the best method to be used in adequately passing across the instruction. Also, for teaching to be rewarding and effective in Nigeria, qualification of teachers in terms of prescribed certificate should not be relegated rather; prospective teachers and teachers already on the job who do not possess the minimum required academic qualification should ensure that they go for training so as to be certified and qualified professionals.

2.3.2 Teachers Factors Influencing Students Performance in KCSE in Kenya

Odhiambo (2010) contends that there is a growing demand from the Kenyan government and the public for teacher accountability in students' performance. Schools are commonly evaluated using students and teachers cannot be disassociated from the schools they teach and academic results of the students. Teachers celebrate and are rewarded when their schools and subjects are highly ranked. According to Yala and Wanjohi (2011) Kenyan teachers who excel in their subjects are rewarded during open days.The study focused on teachers professional training, teachers professional experience, instructional leadership and attitude influencing students performance in KCSE.

The reviewed literature presents studies carried out in different parts of the globe, on matters pertaining to the teacher factors affecting the performance of learners. These

studies have been carried out in other countries, but only a few studies have been carried out in Kenya which is addressing factors affecting students performance such as school environment, instructional materials, efficiency in utilization of the specified teaching period but none has addressed the teacher related factors in Baringo County. This study aimed to fill the missing knowledge gap on the teacher characteristics affecting the performance in Kenya, with the information and data obtained from public secondary schools in Baringo County.

2.4 School Leadership

School leadership is important in the delivery of teaching, which has shifted in the 21st century from higher expectations to a changing role of more accountability for educational outcomes (Mulford, 2003). Leithwood *et al.*, (2002) contended that effective leadership is a key component in empowering students as well as improving classroom management and the performance of teachers and, ultimately, students. School leaders in developed countries such as the United States and England that have adopted a distributed leadership style have helped schools to achieve significant turnarounds in students' academic performance (Harris & Chapman, 2002). School leadership is moving toward a shared partnership, that is, a distributed type of leadership (Spillane, 2005). School leadership nurtures the capacity of teachers to combine teaching and learning, interpersonal skills and mentoring so that they can serve as the foundation to improve academic performance.

Leadership in schools was highlighted in the context of its contribution to teaching, learning, and the creation of an appropriate environment for learning. Mulford (2003) commented that the most consistent finding about school leadership is that the

“authority to lead need not be located in the person of the leader but can be dispersed within the school between and among people” (p. 2). Leadership does not reside in just one person; instead, it is embedded in the entire school community, whose members provide support for the leadership to make changes to the system to improve students’ academic performance. In the context of this study, the distributed leadership framework involves an approach to leadership that includes interactions between people and their situations as well as the enhancement of skills in school leadership and instruction (Spillane, 2006).

Implementation of the distributed leadership framework necessitates a shift in leadership practices to support the full inclusion of teaching staff. Distributed leadership also necessitates shared accountability and responsibility to improve instruction and learning as well as identify the factors contributing to learning inability and underperformance. School leaders can facilitate the development of students’ educational competence to face challenges. Farr (2011) asserted that when school leadership is strategically examined, factors such as classroom management; school environment (i.e., internal and external to the school); and academic performance emerge.

School leadership practices (i.e., those of principals and teachers) can change the academic trajectory of a school. Danielson (2010) emphasized that change itself comes from the collective efforts of teachers, schools, and communities. The school is an organization of learning and knowledge development within the community. School performance centers on academic achievement and teachers are the core component of such achievement. School leadership assists in managing and shaping

the flow of cultural information to support students' academic progress. School leaders who are action oriented and response centered can help teachers to be role models who embody values and success in teaching and learning (Farr, 2011; Spillane, 2005; Townsend, 2010).

School leadership and management is one factor contributing to students' academic underperformance. To decrease students' academic underperformance, Danielson (2010) and Farr (2011) asserted that school leaders must be effective, self-confident, resilient and committed to excellence. Effective school leadership is critical in promoting positive relationships between teachers and students. Farr (2011) deemed that "great teaching is leadership" (p. 30) that combines the applicability and capability of leadership principles employed in the transfer of knowledge. When school staff members use their knowledge and skills, they facilitate dialogue, communication, coordination, and collaboration across the school community.

School leadership requires knowledge, preparation, training and continued professional development to facilitate the interactive participation of students. Farr (2011) identified six leadership strategies that have proven successful in increasing students' academic performance: setting big goals, getting students invested in their learning, planning purposefully, making adjustments as necessary, improving and working tirelessly. Stumbo and McWalters (2010) also noted that effective leadership facilitates the emergence of manageable and sustainable effort when teachers and principals work with students to help them to achieve academic success. An effective school system that supports the positive actions of leaders and teachers can help to decrease students' poor academic performance.

School leadership entails guidance, support and behaviors essential to change overall performance of a school. Yukl (2002) asserted that leadership is an evolving and influential process that leads to the achievement of a desired purpose. Leadership involves inspiring and supporting others to achieve a vision based upon clear personal and professional values. Schools should offer all children a foundation for learning, educational achievement, and development of their social skills. Leithwood, Jantzi, and Steinbach (2002) discussed the importance of accountability and standards in school leaders who work toward a vision of education that combines the societal, system administration, and environmental influences on leadership. Such leadership should be geared toward improved teachers' skills, knowledge, and ability.

Leaders' competence and efficacy play a role in the quality of the school environment and its impact on student learning. Therefore, maintaining student learning is a priority requiring that school leaders respond positively to changes in the management and development of teaching methods, classroom organization and management, and delivery of the curriculum. Recent developments in national accountability standards and changing demographics in schools have led to increased emphasis on the role of principals in leading instructional improvement (Hallinger, 2003, 2005). In fact, emerging research indicates that instructionally focused, transformational leadership affects teachers‟ instructional practices (Goddard *et al.*, 2010). Good leadership falls within and beyond the scope of the principal, however, school leaders should involve teachers in collaborating to bring about school improvement.

Indeed, extant research suggests the importance of teacher collaboration to teachers learning, instructional practice, and differences among schools in academic achievement (Goddard, Goddard, & Tschannen-Moran, 2007; Louis *et al.*, 2009). The design of this study was to examine whether instructional leadership predicts the degree to which teachers collaborate to improve instruction, and in turn, whether these variables predict student achievement. Our conceptual model suggests that principals influence student achievement, albeit indirectly, by creating conditions supporting instructional improvement. We test not only this relationship but also the link between teacher's factors and student achievement. More succinctly, the purpose of this study was to examine the direct link between teacher's collaborative practices and student achievement and the role of the principal in facilitating this relationship.

2.4.1 Principal Leadership

Scholars have demonstrated empirically that the work of school leaders has indirect effects on student achievement, mostly through the support leaders provide to teachers (Hallinger, 2003, 2005; Leithwood & Mascall, 2008; Louis *et al.*, 2009). Walters, Marzano, and McNulty (2003) reported the results of a meta-analytic study of principal leadership and student achievement. They concluded that the average effect size relating leadership to student achievement was .25, with leaders knowledge of curriculum, instruction, and assessment significant predictors of student learning. Similarly, Leithwood, Seashore Louis, Anderson, and Wahlstrom (2004) concluded that school leadership was second only to teaching among school based factors in capacity to improve student performance.

Principal leadership influenced reports of instructional climate and instructional organization, which in turn were significantly and positively related to student

achievement. Witziers, Bosker, and Kruger (2003) found small, direct effects of elementary school principal leadership on achievement but no such effects at the secondary school level. In a meta-analytic study, Robinson *et al.,* (2008) found that both instructional and transformational leadership are related to student achievement, with instructional leadership having a much greater effect. Principals are responsible for supervising, evaluating, and monitoring instruction, curriculum coordination, and gauging student learning (Blase, & Blase, 2000). However, the principal cannot be the sole individual charged with improving a school's instructional program.

The research on principal leadership indicates that principals are most effective when they focus on instructional improvement and collaborate with teachers, encouraging them to work together actively toward instructional improvement (Marks & Printy, 2003; Supovitz, Sirinides, & May, 2010). In fact, some researchers contend that principals need to engage teacher's professional knowledge and judgments so as to not risk creating a school that is too dependent on one person's vision and leadership (Hallinger, 2003; Lambert, 2002). Thus, leaders should encourage and model collaboration.

2.4.2 Insructional Leadership and Students Academic Achievement

Leadeship is an important resource in nation building as it determines its political, economic and social success. The quality of leadership makes the difference between the success or failure of a nation and a bussines organization (Musungu & Nasongo, 2008). According to Hesselbein (2002), Harry Truman defined leadership as the art of getting people to do what they might not otherwise do and like. Leadership has also been defined using the traits or attributes of leadership or the leaders themselves.

Kouzes and Posner (2002) contend that leaders should be honest, forward looking, competent and inspiring.

Bennis and Thomas (2002) state that great leaders possess four essential skills: an ability to engage others in a shared meaning, a distinct and compelling voice, a sense of intergrity and an adoptive capacity. Maxwel links two important leadership characteristics – character and trust by explaining that character makes trust possible and trust makes leadership possible. Leadership is also crucial for the success of schools, Mc Guffin (2011) observed that schools which perform well are led by principals and subject teachers who have the ability to set pace, lead and motivate staff and students to perform to their highest potential.

Schools require good leaders to organize the process of teaching and learning to ensure that the mission of the school is achieved (Lydiah and Nasongo, 2009). Thakur and Thakur (2004) posit that leadership is a major determining factor of the quality of education and school performance. The quality of education depends on the nature of leadership provided by the school principal, his/her ability to control, direct and guide teachers and students. Recent policy discussions in the USA and elsewhere suggest that there is broad support for expanding teachers' participation in leadership and decision-making tasks besides the principals (Huber, 2004).

Research also suggests that increased teacher participation in schools has the potential for significant positive effects on school improvement including students academic achievement (Leithwood & Beatty, 2007; Leithwood *et al.,* 2008; Matthews & Sammons, 2005; Riley & McBeath, 2003). Studies on leadership and academic

performance have tended to focus on principals with only little attention on classroom teachers despite the fact that they play a key role as instructional leaders. Their responsibilities include ensuring educational strategies are in place that support effective learning for all students (Wango, 2009). They serve as a facilitator, guide and provider of instruction (Bakhda, 2006). Good subject teachers understand that that quality instruction is essential for improving students' academic achievement. Literature reveals students taught by teachers with excellent instruction leadership abilities tend to perform better in their academic work (Matthews & Sammons, 2005).

Instructional leadership is a difficult concept to define as its definitions are as numerous as the number of scholars engaged in its study.

Marzano and McNulty (2003) contend that leadership is a process of social influence where one person is able to motivate others to accomplish a common task. It is a about creating a way for people to contribute to making something extraordinary happen (Ross & Gray, 2006). The core role of the instructional leader is to ensure the achievement of the established mission through creating agood environment for the schools (Lezotte, 2001). A study by Musungu and Nasongo (2008) on the instructional leadership established that frequency of teachers supervision of classroom activities, involvement in tuition, revision, pupils' homework, testing and team building contribute towards students academic performance (Ackers & Hardman, 2001).

Instructional leadership resides with the principal to effectively manage resources and staff. Leithwood (1994) discussed the development and importance of instructional leadership in school management and supervision. Instructional leadership

accentuates the behavioral traits of teachers that influence students' performance. Loeb, Elfers, and Plecki (2010) asserted that school leaders must have or develop the competence to become knowledgeable in instructional strategies and effective methods of content delivery. They noted that the supervision of teachers should be viewed as instructional leadership's efforts to improve classroom management.

The principal serves as the team leader who assesses and evaluates improvements in instruction and the quality of student learning. Leithwood (1994) and Loeb *et al.*, (2010) contended that school leadership comprises not only formal authority but also expert knowledge of instruction, teaching, management, and safety within schools. Supervising teaching staff and managing schools require knowledge, application, and the development of methods in instructional leadership to enhance commitment, morale, and motivation. Instructional leadership entails being responsible for developing teachers' capabilities and paying attention to administrative matters such as budgeting, building maintenance, and school nutritional programs. This level of administrative support allows principals to focus their energy and time on academic performance.

Responsibilities and Duties of Teachers

Teachers are considered as instructional leaders because of their roles and responsibilities in a school system. Teachers are general responsibility for: Maintaining and developing subject knowledge and understanding, reflecting on their own practice and seeking continual improvement, taking active responsibility for their own continuing professional development, participating in the school's procedures for performance management. Attending school meetings as appropriate

within designated directed time. Making an active contribution to the implementation of the School Development Plan and school policies and aspirations. Making an active contribution to the wider life of the school community.

Undertaking any other responsibilities and duties commensurate with the post as may reasonably be required by the Headteacher. In addition, all staff are encouraged to: Contribute to the overall life of the school by participating in the running of extra-curricular activities, either acting alone or in conjunction with other members of staff. Attend school functions such as concerts, plays, and events.This gives encouragement to colleagues and students and allows for invaluable informal contacts with parents (TSC, 2010).

Head of institutions are central to the successful management of educational institutions and the implementation of the total curriculum. Those who are appointed as heads of institutions should have appropriate academic and professional qualification, experience, ability competence, integrity and initiative (Republic of Kenya, 1988). The head of secondary school is a Teachers' Service Commission (TSC) employee and oversees all the staff in their performance of duties. According to Bakda (2006), the head teacher is the leader in a school, the pivot around which many aspects of the school revolve, and the person in charge of every detail of the running of the school, be it academic or administrative and bears the ultimate responsibility for all school discipline assisted by teachers and prefects to whom specific duties are delegated to.

Thakur and Thakur (2004) state that secondary school instructional leadership is major determining factor of the quality of education and school performance. Leadership is essential in improving school management and raising standards of education. The quality of education depends on the nature of leadership provided by subject teachers, his ability to control, direct and guide teachers and students. A instructional leader is the focus of authority in secondary school and the crucial link with the outside world. Wango (2009) asserts that a principal is also responsible for the management and maintenance of the school plant equipment and teaching the subject of specialization. The principal delegates responsibilities and duties to deputy head teacher, heads of departments, class teachers and prefects in order to ensure the proper running of the school.

Wango (2009) also pointed out that teachers are recruited, appointed, deployed and promoted by TSC. They are responsible for the actual implementation of school curriculum in their subject areas. As implementers of the curriculum how they deliver content and manage their classes directly affect students academic achievement. Teachers can be assigned duties of a class teacher by the head teacher. Head teachers and assistant teachers are critical for the academic achievement of students. Thakur and Thakur (2004) found out that schools with teachers with good leadership traits perform well in national examinations. They noted that such teachers have strong affective traits and cognitive analytical skills.

Ross and Gray (2006) found out that principals influence students achievement by creating a capacity in terms of teachers' beliefs and committment to the goals of their schools. Nasongo (2009) contend that in order to improve academic achievement

teachers must provide instructional leadership so as to manage and control their lessons well. This is because leadership is a social influene which the achievement of the desired goals.

Subject Teacher and Student Achievement

According Teachers Service Commission (TSC) the role of subject teacher included; develop their subject knowledge, skills and understanding, plan, prepare and teach lessons in accordance with the departmental schemes of work and the syllabuses and specifications of Examination Boards where appropriate, setting anticipated learning outcomes for each lesson. They prepare lesson plans, teach and conduct internal assessments and keep records of work done by students.

In addition they create a positive climate for effective learning in the classroom and maintain order at all times through effective management based on positive relationships with students (TSC, 2010). In addition to the duties and responsibilities assigned by the TSC, teachers meet parents to discuss students' progress and engage in activities geared towards their professional development. They also share with departmental colleagues tasks necessary for effective organisation and management of the school and implement school policies and aspirations (TSC 2011).

Class Attendance and students Achievement

In order for presence of a teacher in a class to enhance learning outcomes, teachers must effectly perform their duties and responsibilities such as planing and preparing lessons and courses in accordance with the subject schemes of work and the National Curriculum/Subject specifications/ school policy. They must also teach lessons in the designated classes as published in the timetable. In addition they should ensure that the needs of each individual students, including those with special educational needs

are known and met.The teacher should also ensure that the environment in the classroom is conducive so that each student can work towards his or her own maximum potential.

Syllabus Coverage and Student Achievement

Armstrong *et al.,* (2009) pointed out that in order to provide quality learning experience for all students, lessons must be well planned and prepared effectively. They describe responsibilities and characteristics of the 21st century committed teachers as: matching instructions and programs to learner's characteristic, conducting task analysis to identify an appropriate beginning point, and a logical sequence for instruction, specifying learning intentions. Lessons should be well prepared to suit the learners' capabilities and interests. Lessons must stimulate learners to want to learn the new information.

Armstrong *et al.,* (2009) further confirms that as one plans for a group of learners he/she needs to engage in what is called "task-analysis activities." Task analysis requires that one takes the content that is to be taught and first identify the desired results from learning of the content secondly break the content into smaller components or sub- tasks that logically build towards the desired results and finally define appropriate teaching approaches for each of the components and specify lesson objectives. Once task analysis has been done satisfactorily then follows lesson presentation. Effective lesson presentation according to Armstrong, has several key elements that include stimulating and maintaining of interest, content presented should interest and motivate individual learners.

The teacher has to use a variety of approaches to motivate learners. Variety is essential because each learner's needs are unique. Motivation should be at the beginning of the lesson, during learning sequence and finally at lesson conclusion. On sequencing of lessons, a lesson presentation follows a logical sequence. Information is presented in an organized manner, regularly checking pupils' understanding, providing an opportunity for practice, giving frequent feedback and concluding lessons by reviewing main points (Armstrong *et al.,* 2009). Planning is a requirement for any program to succeed. A plan is an arrangement or a method for doing something. It is a future intention to act in a certain way in order to achieve set objective. It is a process of arranging and organizing how to do something carefully in advance (MOEST, 2001). A scheme of work is a key planning document for all teachers. It is a personal plan to cover the syllabus taking into account variables like time allocation, pupils' ability levels, and pupils' previous experience, available resources and putting content in a logical sequence.

Other considerations involved in planning the scheme of work include scope to be covered, sequence, objectives, learning activities, learning resource and evaluation. Learning activities refer to the experience you give learners to support the learning of mathematics. They should be well thought out and planned in advance. The activities should be varied involving the child in a practical work, watching demonstration and problem solving and reinforcement activities. Mathematics lesson plan is a short and carefully developed and written outline designed to help the teacher achieve the objectives of a specific topic, skill, or idea (MOEST, 2001).

Indimuli *et al.,* (2009) claimed that teacher preparation is vital for effective teaching and learning process. Effective teaching include: preparation, implementation and evaluation. In preparation, the teacher refers to the syllabus so as to make the scheme of work and lesson plans. In implementation, the teacher is involved in the actual teaching of the content, class management and uses teaching/learning materials to achieve the specified lesson objectives. Evaluation is administered in form of continuous assessment and end-of-course examination. They further describe teacher preparation to include class management. They define class management as involving the creation of a stimulating learning environment in which effective teaching/learning can take place. In order to achieve this, they say that it is advisable to consider grouping of pupils, observing class routine and class organization. On classroom organization, they say that seating arrangement needs to be done in groups. At the same time equipments specific to mathematics lessons should be placed in positions which are easily accessible (Indimuli *et al.,* 2009).

Assessment and Students Achievement

One of the main responsibility of teachers is to ensure that students are assessed through administration of class assignment, homework and tests in accordance with school examination policy. According to Indimuli *et al.,* (2009), assessment is the process of determining the extent to which the stated educational objectives are being achieved. Students are assessed in order to: identify the knowledge, skills and attitude that students have acquired, find out weaknesses and strengths of teaching strategies and learning resources used, motivate pupils as they prepare for a test or examination, help students to know their progress in specific areas and provide a basis for promoting pupils from one level to another.

Assessments are important because, teachers use them to evaluate effectiveness of teaching. They are also used in conjunction with prior attainment to monitor students progress and set achievable targets to promote progression (TSC, 2010). According to Stiggins *et al.*, (2007), there are two types of assessment; for and of learning. Assessment for learning involves use of homework assignments, quizzes, and self assessment drafts. This kind of assessment is student centered and gives the learner an opportunity to find information about areas of strengths and areas of further learning.

Assessment of learning is a periodical assessment like midterms and final examinations which are teacher centered and judgmental for they are meant to inform the final grade of the learner. According to Stiggins *et al.*, (2007) teachers need to address four fundamental questions whenever he/she plans for effective assessment. The questions include; the purpose of assessment, the learning target, the assessment methods and the ways of reporting the results. Once the assessment is conducted, teachers must mark and maintain records of the marks.

MOEST (2001) describes how assessment helps a teacher in the management of instruction. It enables teachers to monitor students' achievement, needs, weaknesses, and strengths. Literature also shows that frequent tests enhances academic achievement. Martens and Witt (2004) argued that without a valid assessment of students' academic skills, instructional decision making is unlikely to promote academic competence. Ballard and Johnson (2004), in their educational research on mathematics assessment, confirmed that frequent quizzes do yield benefits. They compared test results of students who were exposed to quizzes with a control group who experience no quizzes. They found significantly higher scores for students who experienced quizzes and concluded that frequent quizzing influences learning

performance. The mean scores for these students were significantly higher than for students in the control group who experienced no quizzes.

2.5 Teacher Qualification and Students' Academic Achievement

Teacher quality is of important concern to parents and policy makers (Wilson, 2001). But the definition of qualified teacher has come under much scrutiny. For example, there is intense debate over whether alternatively certified teachers should be included under the heading of qualified teachers. The challenge in defining quality teachers illustrates a much more general concern in education. Teacher qualifications refer to credentials and knowledge that teachers bring with them when they enter classroom. These includes coursework, grades, subject matter education, degrees, test scores, certifications and evidence of participation in continued learning such as internships, induction, supplemental training and professional development.

Teacher qualifications help in the regulation of entry into classroom when there are no performance and outcome data for the case of new teachers (Ferguson and Helen, 1996). They are also used as indicators of teacher quality because of the relative ease of and cost effectiveness of data collection which can be found in public records maintained by states and districts. To some extent, teacher qualifications are effective at identifying teachers who improve the achievement of children (Ferguson and Ladd 1996). Some teacher qualifications are consistently associated with increased student achievement in particular subject areas. This is most notable in mathematics where most research studies have concentrated.

A major teacher qualification attribute that has consistently been shown to produce strong positive effects on student learning mathematics is the teachers' knowledge of mathematics matters for student learning in mathematics at all school levels

(Darling-Hammond, 2001). Whether measured by mathematics course taking, certification, or degree, it appears that teachers with stronger mathematics knowledge produce better student achievement in mathematics compared with less knowledgeable teachers (Goldhaber & Brewer, 2001). Thus in this study mathematics course taking, certification, and degree of the teacher was assessed in this study to determine it impact on the preschool children's achievement.

Other attributes that have been investigated in the past include subject matter knowledge, test scores, training institution, advanced degrees, certification, induction and mentoring, professional development, experience and content based pedagogical knowledge (Hanushek, 1997; Jacob, 2007 & Jacob, 2011). Subject matter knowledge has been found to have varied effects on the student achievement. It is strongly related to achievement in higher grades. Studies have established that there exist a stronger correlation between the achievement of secondary school students and their teacher's subject area expertise that exist between the success of younger students and their teacher's subject knowledge (Raymond, Fletcher & Luque 2001).

In particular, several studies indicate that teacher completion of an undergraduate or graduate major in mathematics is associated with higher student achievement in high school and middle school. Given previous association of subject matter knowledge with increased achievement in higher grade classes, this study will not investigate this attribute. On the link between teachers' academic qualifications and students' academic achievement in Mathematics at secondary school level, Darling-Hammond's (1999) and Darling-Hammond and Sykes' (2003) findings suggest that

teacher qualifications have a significant and positive correlation with student achievement.

Furthermore, Darling-Hammond found that uncertified teachers and those with the most non-standard certifications had negative effects on student achievement gains. Darling- Hammond and Sykes (2003) concluded that, in the context of the United States of America (USA), qualified teachers are a critical national resource that requires federal investment and cross-state coordination as well as other state and local action. Similarly, Kaine, Rockoff and Staiger (2006) found that the proportion of lower-performing students at a school was related to the proportion of teachers at that school who were not certified to teach in any of the subjects which they were currently teaching. Boyd, Grossman, Lankford, Loeb and Wyckoff (2006) also found support for the view that teacher preparation programmes in either traditional or alternative pathways had an influence on student gains in New York State achievement tests.

Rice (2003), however, provides a more measured conclusion that teacher certification seems to matter for high school mathematics with little evidence of its relationship to student achievement in the lower grades. Rice's position is somewhat bolstered by Goe (2007), who reported on a 2002 study on California schools to examine the relationship between the percentage of teachers holding emergency permit (EP) teacher certification and student achievement at school level which found a direct negative correlation between the two. Evidence on the link between teachers' academic qualifications and students' achievement thus remains contentious.

The effects associated with teacher's possession of an advanced degree are strikingly counterintuitive; especially given the salary incentives offered to encourage teachers pursue graduate degrees (Rowan, 2002). Recent studies as in Woolfolk and Wayne (1990) have not established any benefits for students of teachers with advanced degrees. Moreover, these studies indicated that teachers with master's degrees and beyond may negatively influence their students' achievement. Other studies however, find marginal benefits for middle school mathematics achievement when teachers hold master's degrees, but this effect is not practically significant. Xu, Jane and Colin (2011) reported that there is no association between teachers holding master's degrees and fourth-through eighth grade student's mathematics test score gains.

Teacher certification which is considered as an aspect of teacher quality. Even though teacher qualification is usually used as an indicator of teacher quality, recent studies have reported mixed findings. Pecheone, Rogers and Moirs (2001) did not find any relationship between elementary and middle school teachers' certification and their student's mathematics achievements. Jacob (2007) and Ballou (2000) in studies conducted in pre-schools established that teacher qualification is either unrelated or positively related to student achievement. However, other studies have shown that teachers with higher licensure test scores have a marginal positive impact on middle school mathematics achievement. Shulman (1986) asserted that higher educational levels increases an instructors knowledge and pedagogical skills. Goldhaber and Brewer (1996) noted a significant improvement in achievement in science students taught by teachers with a masters degree. Thus the relationship between learners achievement and teacher qualification was also investigated in this study.

Darling-Hammond and Bransford (2005) described teacher quality as the knowledge and experience applied effectively to exhibit knowledge about teaching and learning. Other researchers (Smith & Gerard, 2005; Walsh, 2001) would see teacher quality as the teacher's ability to impact student learning and research indicates that this has more to do with the teacher's verbal ability or cognitive ability than with the ability of a teacher to pass some tests to obtain teacher certification (Walsh, 2001). Teacher quality is defined by how effective the teacher is in the classroom in improving students'learning, meeting students' needs in terms of their interests, entry levels, and readiness and creating an atmosphere of learning for all students (Burnett & Meacham, 2002; Tomlinson, 2000).

Although there are instances where some students are being handled by teachers without full qualifications in Kenya, majority of teachers have requisite qualifications. For instance, data from the year 2000 shows that over 95% of the teachers in public secondary schools were trained in the relevant fields. For instance, about 97% of teachers in public secondary were trained. However, the number of trained teachers in public secondary schools dropped by about 2% to about 95% in 2003. This drop was short lived as in the following years about 97.9% of teachers in public secondary schools were trained.

The number of trained teachers in secondary schools rose from 97.9% to 99.7, and 99.8% in the year 2008, 2009 and 2010 (MOE, 2011). This suggests that less than 1% of teachers in secondary schools were untrained. This is evidence enough that most of the teachers in Kenya have requisite minimum training. Despite meeting requisite level of education and training, a number of teachers at both primary and secondary

schools have and continue to pursue further education. The government and institutions of higher education alike have developed flexible learning opportunities through the provision of study leave, limited financial aid and school-based learning programs to teachers who wish to pursue further education. While different motives underlie pursuit of education, Chapman and Mählck (1997) assert that higher qualification is a widely employed strategy of improving instructional quality.

Shulman (1986) reinforces this idea by stating further training increases the instructor's content knowledge, pedagogical content knowledge and curricular knowledge. While there is no comprehensive and nationwide data on the number of teachers with education levels superior to their levels of a teacher, a survey of selected districts in 2009 showed that 3% of the primary school teachers surveyed had undergraduate degrees (Abuya, Oketch, & Musyoka, 2013). This suggests that a number of teachers at both primary and secondary schools have been undergoing further training. What remains unclear is whether teachers with qualifications higher than minimum qualifications are more effective than their counterparts with requisite levels of training. Studies done in different parts of the world report different results on this subject as the following discussions reveal.

Teacher education level is one of main attribute of teacher characteristics, has gained attention and has been the focus of many investigations. However, results of literature reviews examining the relationship between student achievement and teacher education level are in conflict, with some suggesting a positive relationship and others suggesting no relationship (Goldhaber, 2004; Wenglinsky, 2002). A review conducted by Hanushek (1989) about over decades ago concluded that there was no strong

evidence existed to suggest that teacher education had the expected positive effects on student achievement.

But the basic assumption still remains that the more teachers are academically as well as professionally prepared the more likely they are to do a better job. The evidence to support this notion comes from developed countries (Saha, 1983) as well as from developing countries (Lockheed, 1989). Research on the importance of teacher training provides mixed results. Some of the variables showed positive relationships, while others showed negative or no association to student learning. They concluded that the more carefully designed and executed studies revealed a positive relationship between teacher training and student achievement.

While focusing on the subject of the degree rather than the level Goldhaber and Brewer (2001) found in their study that only science teachers who had Master's degrees in science improved student science achievement substantially. On the other hand, science teachers with a master's degree in a subject other than science had not had great impact on student science achievement. Similarly, Xin *et al.,* (2004) reported that when controlling for degree of subject, teachers with a math major positively contributed to student math achievement. It would be important to investigate whether teachers with a higher degree in science or a relevant area, such as education, was more effective in improving student science achievement than the teachers with a higher degree in a non-relevant area. Teaching effectively, is heavily dependent on the ability to understand student thinking but there is concern among some educators regarding the impact of teacher qualification standards on teacher quality (Zientek, 2007).

Darling – Hammond (1998) defines well qualified teacher as one who was fully certified and held the equivalent of a major in the field being taught. Although the formal qualification of teachers is an important indicator for their knowledge and competence in teaching, it has only limited utility in analyzing how well prepared teachers are for what they have to teach in schools. More detailed knowledge of the courses they have taken during their training needs to be compared to the actual content and skills required to teach the high school's curriculum. Ruthland & Bremer (2002) refer to teacher qualification in two ways - traditional and alternative qualification routes. Traditional certification is when an individual completes an undergraduate degree or post graduate program in education.

Alternative routes of certification are based on coursework in pedagogy and subject area without a degree in education. Hardy & Smith (2006) cite short term activities such as mentoring, peer evaluations and workshops as ways other than formal qualifications for improving teaching. More often graduates teachers with first degree content go into teaching if they cannot find another job right away. Although they often get somewhat lower salary than a fully qualified teacher; they choose not to enroll in the one year post-graduate professional training and therefore lack a basic foundation for teaching.

Huang & Moon (2009) documents that teacher qualification accounted for approximately 40 to 60 percent of the variance in average of students' achievement in assessment. Richardson (2008) reveals that students in urban areas performed better than those in rural areas. The researcher suggests that the availability of

enough qualified teachers must have been a determinant for students' performance.

Wilson *et al.*, (2001) suggest that even with the shortcomings of current teacher education and licensing, fully prepared and certified teaches are more successful with students than teachers without this preparation.

Ashton (1996) notes that teachers with regular state certification receive higher supervisor ratings and student achievement than teachers who do not meet standards, but this observation was based on data with virtually no statistical controls having been imposed. In spite of the quantity of research on the benefits of teacher certification for student learning, little of the past research exercised controls over student "inputs" that would give the critical reader confidence in the findings.

Laczko & Berliner (2001) assert that the impact of certification status on student achievement in two large urban school districts in the United States of America. These school districts provided information about teachers hired for the 1998-1999 and 1999-2000 school years. Information included the school where they were currently teaching, the grade level taught, the teacher's certification status, highest degree earned, date and institution where it was achieved, age, and number of years teaching experience. It has been evidenced that in many countries, teacher qualifications that are considered to be related to student learning have become desirable targets of teacher education reform.

Some of these reforms call for the professionalization of teacher education by making it longer, upgrading it to graduate programs, and regulating it through

mechanisms of licensure, certification, and promotion aligned with standards (Darling-Hammond *et al.,* 2001; 2002). Findings related to teachers' academic degrees (for example; bachelors or masters among others) are inconclusive. Some studies suggest positive effects of advanced degrees (Rice, 2003; Wayne & Youngs, 2003). Some argue that the requirement of a second degree raises the cost in terms of teacher education and the time it involves and may prevent quality candidates from choosing this profession (Murnane, 1996).

This characteristic is related to the subject-matter knowledge teachers acquire during their formal studies and pre- service teacher education courses. The evidence gained from different studies is contradictory. Several studies report a positive relationship between teachers' preparation in the subject matter they later teach and student achievement (Goldhaber & Brewer, 2000), while others have less unequivocal results. Monk & King (1994) find both positive and negative effects of teachers' in-field preparation on student achievement. Goldhaber & Brewer (2000) find a positive relationship in mathematics, but none in science. In addition, Rowan *et al.,* (1997) report a positive relationship between student achievement and teachers' majoring in mathematics. Monk (1994) observes that having a major in mathematics has no effect and a significant negative effect of teachers with more coursework in physical science.

However, in Kenya, some schools in the rural areas have performed better than their urban counterparts (Owoeye & Yara, 2011). Maundu (1986) concludes that there was significant correlation between teacher qualification and pupil performance in Kenya. The good performance was attributed to excellent

instructions given by qualified teachers in addition to other inputs. Maundu (1986) establishes that teachers who had graduated from Kenya Science Teachers College were more practically oriented than those who had degrees from public universities.

> It is generally acknowledged that promoting teacher quality is a key element in improving primary and secondary school education and one primary goal in education is to have a highly qualified teacher in every classroom (Harris and Sass, 2008).

Education, according to Kharshud (2008) education is broad term, the life long process of acquiring knowledge and skills through both formal and informal exposure to information, ideas and experiences. To impart knowledge, teacher plays pivotal role towards the student learning. Gilbert (2013) asserts that a lot of teaching is experience not training and therefore content knowledge is not the key to successful teaching and therefore concludes that there is no correlation between academic performance and good teaching except in high school courses.

According to Karpati (2009), studies conducted in 25 countries in Europe concluded that teacher quality is the most important factor in an education system and the second most important factor (only preceded by family background) among the variety of influence affecting student achievement and further remarks that an education system cannot exceed the quality of its teachers. Studies conducted in Florida, U.S.A on teacher training, quality and Student Achievement in Mathematics found out that content-focused teacher processional development is positively associated with productivity in middle and high school mathematics (Harris and Sass, 2008). In Bangladesh, studies carried out in city secondary schools found out

significant impact of some teachers professional development activities on school result improvement (Enamul, Gazi, and Kanesean, 2011).

Pre-service teacher training and having a Master's level qualification together raises student achievement by about one-fifth of a standard deviation – thus a small, but statistically significant effect (Kingdon, 2006). This was the outcome of a study conducted in India on whether teacher certification and higher pay improves student performance. Olatunji and Nuvadeen's (2010) study in Ondo State, Nigeria concluded that there is positive relationship between teachers attributes and students' academic performance in Geography measured in terms of knowledge of subject matter, communication ability, and interest in the job and student academic achievement.

In Kenya, studies conducted by Agwanda (2002) on Student Achievement in National Examinations in Kisumu Municipality concluded that teacher qualification had positive correlation with student performance. The analysis showed that the higher the percentage of qualified teachers, the higher the candidates' scores in examinations. Yara and Otieno's (2010) study on academic achievement in mathematics in secondary schools in Bondo District concluded that performance in mathematics was below average and cited the inadequate in-service to teachers of mathematics as the main cause of the situation.

2.5.1 Teachers' Professional Qualification and its Influence on Students Achievement

A profession is a type of a job that needs high level of education and training. Teacher trainees in colleges and universities are equipped with skills (the art or pedagogy) of

teaching. This implies that after undergoing training one becomes an authority in his or her field of operation. According to Kimani (1991), in-service training in mathematics boosts the teacher's confidence in the teaching of the subject, improves his attitude towards the subject and attainment of adequate subject knowledge. Even with the highest professional qualification possible, teachers should always strive to improve their skills and knowledge.

Bell (1978) asserts that one should ever remain a student which is supported by Farrant (1980) who observed that the teachers of today have greater responsibilities and therefore should have a life-long access to training at all levels and at all times appropriate to their needs. Hence, in-service training and involving preschool teachers was investigated in this study. Darling-Hammond, (2001) shows that certain types of professional development contribute to teacher quality and student achievement. Sustained professional development that is aligned with the curriculum and focused on instruction has show to positively influence school level achievement in mathematics and science at both elementary and high school. However, other studies dispute this view. Teacher's content specific pedagogical knowledge is significantly associated with students' mathematics achievement at all levels (Darling-Hammond, 2001).

A study in Darling-Hammond (2001) found a strong association between the number of mathematics pedagogy courses teachers had taken with student achievement at the elementary, middle, and high school levels while another established that the teacher's mathematics pedagogical knowledge of both elementary and high school is strongly related to teacher level predictor of student achievement.

Moreover, teacher's content knowledge has been found to be positively associated with elementary student achievement in reading, mathematics and language thus, refresher courses taken by teachers was looked into.

Some earlier studies that have continued to the current studies included Kathuri (1986) who identified that, a professionally trained teacher contributes more positively to effective learning than untrained one. It is for the same reason that teacher training exists as a major part of education systems throughout the world. Eshiwani (1985), pointed the general agreement of teachers' professional qualification is related to the performance of learners in mathematics. Teacher training should therefore stress on teacher quality. Kirembu (1991) found that both professional and academic qualifications of the teacher are important in ensuring good performance of learners in mathematics. This explains the importance of recruiting qualified persons for teacher training. Thus teachers' professional qualification and it influence on the learners achievement was focused in this study.

Wayne (2002) argued that the training institution a teacher attends may be a useful indicator of teacher quality. However, recent studies do not support this view. In spite this; older studies have found marginal relationship between the selectivity of a teacher's undergraduate institution and his or her student's achievement of which was investigated in this study. Viewing student achievement as evidence of learning, and linking student learning to the "effective" (Berliner, 1987; 2005) or "successful" (Fenstermacher & Richardson, 2005) teacher, is one way of defining quality teaching. This approach differs from that which identifies the quality teacher with the so-called "good teacher" – one who upholds the standards and norms of the profession.

Fenstermacher and Richardson (2005) describe this distinction in the following way; By good teaching we mean that the content taught accords with disciplinary standards of adequacy and completeness and the methods employed are age appropriate, morally defensible and undertaken with the intention of enhancing the learner's competence with respect to content. By "successful teaching" we mean that the learner actually acquires some reasonable and acceptable level of proficiency from what the teacher is engaged in teaching (from Berliner, 2005, p. 207).

Because of psychometric difficulties in assessing teachers by their normative attributes – the logical, psychological, and especially the ethical, which tend to differ across cultures (Alexander, 2000) – the tendency to evaluate teacher qualities on the basis of student performance is further emphasized. With the increased demands for accountability in line with performance standards and with the growing demand for evidence-based policy making, students achievements are considered an accurate measure of effectiveness and has become a basis for value-added teacher assessment systems (Braun, 2005; McCaffrey, Lockwood, Koretz, Louis, & Hamilton, 2004; Sanders, 2000; Sanders & Rivers, 1996). This approach also gained support from the point of view of the effectiveness of teacher education systems.

In tracing teacher education development and reforms in terms of the major questions that have driven the field, Cochran-Smith, (2001) argues that it is currently "the outcome" question that motivates teacher education research and policymaking. She states three ways in which outcomes of teacher education are constructed: the long-term impact outcomes, teacher test scores and professional performance. Long-term outcomes refer to the relationship between teacher qualifications (their test scores on licensure examination; level of degrees, years of

experience, preparation in subject matter and in pedagogy; certification in their expertise area, and their ongoing professional development) and student learning (student gain scores on achievement tests). This relationship is taken to be the percentage of variance in student scores accounted for by teacher qualifications when other variables are held constant or adjusted (Cochran-Smith, 2001) and is the focus of this study.

In many countries teacher qualifications that are considered to be related to student learning have become desirable targets of teacher education reform. Some of these reforms call for the professionalization of teacher education by making it longer, upgrading it to graduate programs, and regulating it through mechanisms of licensure, certification, and promotion aligned with standards (Darling-Hammond, 1998, 1999; Darling-Hammond, Berry & Thorenson, 2001; Darling-Hammond, Chung, & Frelow, 2002). The impact of these policies on student learning was explored in several meta-analytic studies mainly based on U.S. data, but also on the basis of other countries' data bases (Darling-Hammond, 1999; Greenwald, Hedges, & Laine, 1996; OECD, 2005, Santiago, 2002; Wayne & Youngs, 2003; Wilson, Floden, & Ferrini-Mundy, 2001) as well as on more specific policy-targeted or more local studies (Harris & Sass, 2006; Ingersoll, 2003; Wilson, Darling-Hammond, & Berry, 2001).

In Israel too, teacher qualifications have become the target of several recent reforms such as those announced by different teacher unions (2004), the National Task Force for the Advancement of Education in Israel (Dovrat Report, 2005) and the Committee of the Commission for Higher Education (Ariav *et al.,* Report, 2006). All these

reforms envision improvement of the candidate selection process, upgrading the disciplinary preparation of teachers, opening second degree programs for M.Ed. or M.Teach and providing opportunities for professional development.

In light of the relatively few studies conducted in Israel on the impact of these recommended policies on student learning, and conflicting results obtained from the many studies conducted elsewhere, this paper uses data obtained in the TIMSS-2003 study in Israel, to validate some of these policies and more specifically, to re-examine on the basis of the Israeli data, the extent to which advanced academic degrees, majoring in the field of teaching, years of experience and intensive participation in professional development activities, all assumed to be cardinal teacher qualifications, indeed have a positive impact on student learning. The following section offers a summary of research findings related to each of the teacher qualifications dealt with in this study;

Teachers' Formal Education

Findings related to teachers' academic degrees (e.g., bachelors or masters, among others.) are in- conclusive. Some studies showed positive effects of advanced degrees (Betts, Zau, & Rice, 2003; Wayne & Youngs, 2003), while others showed negative effects (Ehrenberg & Brewer, 1994; Kiesling, 1984). Some argue that the requirement of a second degree raises the cost in terms of teacher education and the time it involves and may prevent quality candidates from choosing this profession (Murnane, 1996).

Teacher Education in the Subject Matter of Teaching (in-field preparation)

This characteristic is related to the subject-matter knowledge teachers acquire during their formal studies and pre-service teacher education courses. The evidence gained

from different studies is contradictory. Several studies show a positive relationship between teachers' preparation in the subject matter they later teach and student achievement (Darling- Hammond, 1999, 2000; Goldhaber & Brewer, 2000; Guyton & Farokhi, 1987), while others have less unequivocal results. Monk and King (1994) find both positive and negative effects of teachers' in-field preparation on student achievement.

Goldhaber and Brewer (2000) find a positive relationship in mathematics, but none in science. Also, Rowan, Chiang and Miller (1997) report a positive relationship between student achievement and teachers' majoring in mathematics. Monk (1994), however, finds that having a major in mathematics has no effect, and a significant negative effect of teachers with more coursework in physical science. Recent studies in the USA on the widespread phenomenon of out-of-field teaching, Ingersoll (2003) portrays a severe situation where almost 42% - 49% of public Grade 7-12 teachers teaching science and mathematics actually lack a major or full certification in the field (1999- 2000 data). In Israel, according to a recent survey (Maagan, 2007), these percentages are even higher for elementary teachers – 42% in mathematics and 63% in science (2005-2006 data).

Teacher Education in Pedagogical Studies

Studies have found somewhat stronger and more consistently positive, influence of education and pedagogical coursework on teacher effectiveness (Ashton & Crocker, 1987; Everston, Hawley, & Zlotnik, 1985; Ferguson & Womack, 1993, Guyton & Farokhi, 1987). Some studies compare the effect of courses in pedagogical subject matter to that of courses in the subject matter itself and present evidence in favor of the pedagogical subject matter courses (Monk, 1994) in mathematics. Other

studies reveal no impact of education courses on students' science achievement (Goldhaber & Brewer, 2000).

Duration of the Preparation Period

In spite of evidence that 5-year programs result in a higher retention rate and career satisfaction of their graduates than 4-year programs (Andrew, 1990), it has not been shown that these graduates become more effective teachers. Data collected in TIMSS-2003 in Israel cannot provide such evidence as the information regarding the question about duration of the preparation periods does not differentiate between those who attend consecutive teacher preparation programs at the universities (1-2 year programs after completing first degree in a discipline) and those who attend concurrent programs at teacher colleges (4-5 year integrated disciplinary and pedagogy program).

Certification and Licensing Status

Certified teachers are usually those who graduated in accredited teacher education programs; some are also required to complete an induction program or to pass a national teacher examination test in order to obtain a license. There is debate in the USA between those who demand full certification (Darling-Hammond, 1999; Darling Hammond, Berry, & Thorenson, 2001) and others (Goldhaber & Brewer, 2000) who argues that pupils of teachers who hold full certification achieve similarly to those who study under teachers with temporary, "emergency" credentials. These authors also argue that relaxing requirements for certification is a way of attracting academically-talented college graduates to teaching and a way to recruit a more diverse pool of candidates needed for a diverse student population. Data obtained in TIMSS-2003 in Israel did not allow to examine this issue as all participating teachers were fully certified.

Years of Experience

Studies on the effect of teacher experience on student learning have found a positive relationship between teacher effectiveness and their years of experience, but not always a significant or an entirely linear one (Kitgaard & Hall, 1974; Murnane & Phillips, 1981). The evidence currently available suggests that while inexperienced teachers are less effective than more senior teachers, the benefits of experience appear to level off after a few years (Rivkin, Hanushek, & Kain, 2000). The relationship between teacher experience and student achievement is difficult to interpret since this variable is highly affected by market conditions or motivation to work during child rearing period.

Harris and Sass (2007) point to a selection bias that can affect the validity of drawing conclusions about the effect of teacher's years of experience. If less effective teachers are more likely to leave the professions, this may give the mistaken appearance that experience raises teacher effectiveness. Selection bias could, however, also work in the opposite way as more able teachers with better opportunities to earn may be more likely to leave the profession.

Participation in Professional Development Activities

Professional development activities can be conducted by many different organizations, in schools and out of school, on the job or on sabbatical leave. On these occasions, practicing teachers update their content knowledge and teaching skills to adjust to the introduction of new curricula, new research findings on teaching and learning, changes in the needs of the student population, among others. Critique has been leveled against the episodic nature of these activities and the fact that very little is known about what they really consist of. There is

mixed evidence on the effect of teachers' participation in professional development activities on student outcomes.

On the one hand there are some studies on in-service professional development, which found no effect (Angrist & Lavy, 2001, Jacob & Lefgren, 2004), while other studies found that higher levels of student achievement were linked to mathematics teacher participation in content-specific pedagogy activities related to the curriculum (Brown *et al.*, 1995; Cohen & Hill, 1977; Wiley & Yoon, 1995).

Wenglinsky (2000) found a positive effect of professional development activities that focused on the needs of special education students, on higher-order skills and on laboratory skills in science. More recently Harris and Sass (2007) identified what they call the "lagged effect of professional development", i.e., the larger effect of professional development three years after taking place. The correlation between student achievement and teacher professional development activities does not allow us to draw conclusions about a causal link, as this variable is confounded with other attributes of teachers, i.e., participating teachers are likely to also be more motivated and usually more specialized in the subjects they teach.

Hanushek's (1989) analysis of 113 studies found that teachers who hold advanced degrees did not predict higher levels of student achievement in 100 out of 113 studies. Of the 13 studies where teacher advanced degrees were a significant predictor variable, the results were split between positive and negative relationships. In other words, teachers with an advanced degree had a negative impact on student

achievement in 6 of the 13 studies. Greenwald, Hedges & laine (1996) found that in 15 percent of the 60 studies they reviewed, teachers who had a master's degree produced students who achieved better than teachers without a master's degree, but in 13 percent of the studies teachers with master's degrees had a negative effect on student achievement. A third study by Ferguson and Ladd (1996) found no student achievement advantage in either reading or math for students who were taught by teachers with master's degrees. The results from 174 studies demonstrate that teachers who hold advanced degrees do not produce better performing students.

Many studies have established that inexperienced teachers (those with less than two years of experience) are typically less effective than more senior teachers. However, the benefits of experience appear to level off after about five years (Darling-Hammond, 1999). Hanushek's (1999) review of 140 studies found that in only 30 percent of the studies teacher experience was correlated with student achievement. Hanushek, however, claims that the positive correlation may result from senior teachers being permitted to select schools and classrooms with higher achieving students and less discipline problems.

Greenwald, Hedges and Laine (1996) reviewed 60 studies, 30 percent of them showed a positive and statistically significant relationship between teacher experience and student achievement. Rubenstein (2000) in his analyses of teachers years' experience in Massachusetts, Texas, Virginia, Florida and Georgia found that elementary teachers with more than 25 years experience produced students with significantly lower National Assessment of Educational Progress scores than teachers with between 6–10

years experience. Further gains for student achievement were nonexistent for teachers teaching between 11–24 years.

A report released by the Charles Dana Center (1999) used data from Texas' 250,000 public school teachers to determine the achievement effect that certified versus non certified elementary instructors had on the state's third-grade student population. Using Texas third-grade performance tests, the data showed that 75 percent of third graders taught by teachers with a teaching credential passed all sections of the tests. The figure dropped to 64 percent when fewer than 85 percent of third grade teachers were certified.

In Evertson, Hawley & Zlotnik's (1985) review of the research compared regularly certified teachers to provisionally or emergency certified teachers, 11 of the 13 studies showed that regularly certified teachers were ranked higher in effectiveness in terms of both student achievement and teaching performance judged by administrators. Ferguson and Womack (1993) found that the amount of education coursework completed by regularly certified teachers explained more than 4 times the variance in teacher performance than did measures of teacher content knowledge.

Teacher's self-efficacy has been found to be associated with enhanced student's motivation, increased self-esteem, strong self-direction, ease in managing school transitions, and more positive attitude toward school (Miskel, McDonald, & Bloom, 1983). Teacher's self-efficacy may also contribute to promote student's sense of efficacy, fostering their involvement in class activities and their efforts in facing difficulties (Ross, Hogaboam-Gray, & Hannay, 2001).

In addition, other findings suggest a reciprocal effect between a teacher's perceived self-efficacy and a student's achievement, showing that teacher's perceived self-efficacy is particularly high in schools with high-achieving and well-behaved students (Ross, 1998). As teachers of talented and disciplined students are more likely to be successful in their activities and tasks than teachers of students who present learning or disciplinary problems, the repeated experiences of success with students may enrich their experience and contribute to their robust sense of efficacy.

Research has also found that teachers' sense of efficacy is related to their satisfaction with their choice of profession and their competence as rated by school superintendents (Trentham, Silvern, & Brogdon, 1985). Recent findings have shown that teachers' self-efficacy beliefs have a crucial role in affecting and sustaining their commitment to school and their job satisfaction (Caprara, Barbaranelli, Borgogni, & Steca, 2003). It is likely that job satisfaction accompanies teachers' sense of efficacy and contributes to sustain their efforts towards pursuing children's optimal scholastic attainments. As recently demonstrated by a study on over six thousand American teachers, pay satisfaction is positively related to academic performance measured at the school district-level (Currall, Towler, Judge, & Kohn, 2005).

Guyton and Farokhi (1987) demonstrated consistent, strong, and positive relationships between teacher education coursework completed and teacher performance in the classroom. In their research of 2,101 high school math teachers and 1,380 high school science teachers, Goldhaber and Brewer (1999) found that teachers who have a standard certification in the subject they teach have a statistically significant positive

impact on student test scores relative to teachers who either are not certified or are certified out of the subject.

Although these results demonstrate that regularly certified teachers outperform non-certified or provisionally certified teachers in terms of student achievement and observations by administrators and others, this research, should be viewed with some skepticism. First, only a small portion of the studies conducted relates to a number of studies have pointed to the influence of teacher's self-efficacy beliefs on children's cognitive achievements and success at school (Muijs & Rejnolds, 2001).

2.6 Teacher Experience and Students' Academic Achievement

With regard to teaching experience, it is important to bear in mind that some research has suggested that the positive effects of teaching experience in relation to students' achievement are not constantly additive, but instead tend to level off after a few years (Rivkin, Hanushek & Kain, 2005). Greenwald, Hedges and Laine (1996) and Rice (2003) have demonstrated a significant and positive relationship between teachers' number of years of experience and student achievement. However, these authors argue that the relationship is not linear. It is important to balance these studies on teacher experience with the finding that teachers' effectiveness in improving student achievement appears to increase most in the first three years of teaching, but no major improvement in their effectiveness has been observed after three years of teaching experience (Boyd, Grossman, Lankford, Loeb & Kain, 2005).

Teaching experience can be perceived as reliable prediction of a person's ability to handle a certain task. Sidhu (1982) attests that successful teaching experience is a valuable asset. Bell (1978) continues to say that teaching experience can be useful in

teaching by ensuring that the teacher selects appropriate models of instruction. It is believed that an experienced teacher is knowledgeable and has gained variety of skills of teaching by teaching for long period of time. However, according to Hanushek (1971), Hanushek (1999) and Hanushek (2001) this is only applicable in the first five years of teaching mathematics. During this initial five years of teaching, teachers seem to incrementally contribute to student learning. After the initial five years of teaching, the contribution of experience to student learning appears to level off. Experience, especially during the first five years in the classroom, is positively associated with student achievement in mathematics and reading at the elementary and middle school levels.

Barnes (1985) observed that teachers effectiveness while it may increase through the early years of teaching, it may not directly follow the same pattern in the latter years of teaching. Thus, the attribute of teachers' experience was investigated in this study. According to Goe (2007), teacher experience may entail classroom practices teachers employ. They include the ways in which teachers interact with students and the teaching strategies they use to accomplish specific teaching tasks. The practices may involve aligning instruction with assessment, communicating clear learning objectives and expectations for student performance, providing intellectual challenges, allowing students to explain what they are learning, using formative assessment to understand what and the degree to which students are actually learning, offering active learning experiences and subscribing to cohesive sets of best teaching practices. Teacher practices refer to a process view of teacher quality, which could be described as instructional quality.

Kimani (1991) goes ahead to point out that the practice of teaching mathematics and keeping up with new knowledge could influence the achievement in mathematics. In order to produce quality mathematics teachers for primary schools, he recommended that teaching experience should be sufficient before admission for in-service courses. Goe (2007) assert that teacher practice variables include alignment of instruction and assessments, clear learning objectives and performance expectations, intellectual challenge, explaining what they are learning, formative assessment, active learning, teacher practices as measured by expert observers, principals' subjective assessments of teacher quality. Goe (2007) goes on to report that there is a positive association between cognitively engaging on challenging instruction with elementary and middle school achievement in mathematics and reading.

A review conducted by Hanushek (1989) concluded that there was no strong evidence to suggest that teacher experience positively influenced student achievement. Other studies by Benz, Bradley, Alderman, and Flowers (1992), which examined differences across different levels of teaching experience ranging from pre-service teachers to college professors and indicated that more experienced teachers reported higher students' achievements. Similarly, research findings by Prieto and Altmaier (1994) indicated a significant positive relationship between prior training and previous teaching experience with teacher self-efficacy. In the study, graduate teaching assistants with prior training and teaching experience reported higher self-efficacy than their counterparts who did not.

Although this study was done in the context of higher learning institutions, it nonetheless shows that teachers effectiveness increase with years of teaching. Also,

Woolfolk-Hoy and Spero (2005) conducted a research investigating changes in teacher self-efficacy during the early years of teaching and found significant increases in teacher self-efficacy during student teaching, but a significant decrease the first year of teaching. They related this decline to the fact that novice teachers realized that teaching was beyond method and strategy.

Teacher experience has significant effect on pupil's performance in primary school and at hyper secondary level. Experienced teachers have a richer background of experience to draw from and can contribute insight and ideas to the course of teaching and learning. The importance of experienced teachers in schools has been highlighted by many researchers (Akineye, 2001; Ogundare 2001). Ijanya (2000) pointed out that experience improves teaching skills while pupils learn better at the hands of teachers who have taught them continuously over a period of years. The study by Charles (2002) indicated that there was need to involve retired teachers because of their long years of teaching experience to teach in Nigerian schools. However, the evidence currently available suggests that while inexperienced teachers are less effective than more senior teachers, the benefits of experience level off after a few years (Rivkin, Hanuskek & Kain 2000).

Studies by Caroll and Foster (2010) also provided evidence that the number of years of teaching is positively related to student achievement. The effects of teacher experience on student achievement depend on the number of years of experience and the grade level taught. Similarly, research indicates that teacher experience contributes to students learning for teachers in their first few years in the classroom but additional experience does not make a difference after that (Boyd, Grossman, Lankford &

Wyckoff, 2006; Clotfeller *et al.*,; 2006; Ferguson 1991; Goe, 2007; Greenwald, Hedges & Laine, 1996; Loeb & Beteille, 2008; Rice 2003; Rivkin *et al.*,; 2005; Rockoff, 2004).

The importance of experience teachers in schools has been highlighted by many researchers. Some of these researchers have argued that experience improves teaching skills while pupils learn better at the hands of teachers who have taught them continuously over a period of years (Ijaiya, 2000). Teachers' experience is very important because it has played a crucial role in educational attainment since teacher is ultimately responsible for translating policy into action. According to Okorji and Ogbo (2013) experienced teachers have been conceptualized as one who produces desired results in the course of his duty as a teacher.

Teacher experience has a significant effect on performance in primary and upper secondary school levels. Experienced teachers have a richer background of experience to draw from and can contribute insight and ideas in the course of teaching and learning, are open to correction and are less dictatorial in classroom. Students taught by more experienced teachers achieve at a higher level, because their teachers have mastered the content and acquired classroom management skills to deal with different types of classroom problems (Gibbons *et al.*, 1997). Furthermore, experienced teachers are considered more able to teach topics to students who differ in ability, prior knowledge and background (Stringfield & Teddlie, 1991).

Teachers attendance of in-service training is one of the indicators of experience.

Teachers' motives to attend in-service training can be manifold, for example, increase in salary, career planning, keeping up with developments, filling in lacunae, removing insecurity and meeting colleagues. In the Science Education Project in South Africa (SEP), the objectives were mainly formulated by the developers after having consulted various experts who had experience with Education in Africa. The teachers in this program did not have any experience with practical work. They had a better idea of lesson content and methods, formulation of objectives only at a later stage of their in-service training course (Fullan, 1992).

Experience enables teacher to interact with students with different characteristics and this help them know their learners better. This knowledge assists teachers to connect with students and this may assist the learners benefit from the teachers' experience in reconstructing their world (Akineye, 2001). The knowledge that teachers need about students in order to connect with them is gained through interaction. For many reasons, measuring the real impact of experience on a teacher's effectiveness is complex, more so than measuring any other teacher attribute. Consequently, many well-constructed research attempts to interpret the relationship between experience and effectiveness have produced varying results that reveal no particular pattern. Murnane (1996) found that teacher effectiveness improves rapidly over the first three years of teaching and reaches its highest point between the third and fifth year but found no substantial improvement after year five.

In contrast, a number of studies suggest that teacher experience effects may be evident for a longer period of time. Murnane and Phillips (1981) state that

experience had a significant positive effect on elementary student achievement among teachers during their first seven years of teaching. Ferguson (1991) reveals that at the high school level, students taught by teachers with more than nine years of experience had significantly higher test scores than students whose teachers had five to nine years of experience. Rivers and Sanders (2002) suggest that teacher' effectiveness increases dramatically each year during the first ten years of teaching". In the extreme case, Clotfelter *et al.,* (2007) found evidence of growing teacher effectiveness out to 20 or more years in their analyses of North Carolina teacher data, although more than half of the gains in teacher effectiveness occurred during the first few years of teaching.

Stronge *et al.,* (2007) assert a positive relationship between teachers' verbal ability and composite student achievement, verbal ability has been considered an indicator of teacher quality. The basic logic is that teachers rely on talk to teach (explaining, questioning, and providing directions). What verbal ability means and how to measure it, it turns out, are not straightforward. Lai (2011) measured teachers' verbal ability with a 30-item sentence completion test. Thus, though talk about the importance of teachers' verbal ability persists, it is not a strong measure of teacher quality.

Adeyegbe (2000) posited that many students perform poor in examinations as a result of in-experience in teaching methodology and content. Supporting this point, Oderinde (2003) remarked that teachings of students by unqualified teachers who are inexperienced in teaching methodology are among the reasons why many candidates find it difficult to pass their examinations. In order words, when inexperienced

teachers handle students their learning achievement is likely to be affected

negatively. It is therefore, very important to research into the teachers' experience on the learning achievement among secondary school students.

Teachers experience influences student's achievements in several ways. Teachers with long experience use better classroom management approaches and adequate teaching methods that encourage students. autonomy and reduce custodial control (Guskey & Passaro) thus taking responsibility for students learning needs, managing classroom problems and keeping students on task (Chacon, 2005). Studies have established that in experienced teachers (those wish less than two years) are wish less than two years) are typically less effective than more senior teacher. However the benefits of experience appear to level after five years (Darling- Hammond, 1999).

There has been a growing concern in the performance of secondary schools in Kenya. The poor performance of students is a concern for all stakeholders. Poor performance in most secondary schools has been attributed to a number of factors which range from school factors, student related factors and government related factors, status of teaching force; availability and adequacy of physical resources; efficiency in utilization of the specified teaching period; student performance in key subjects; instructional materials crucial to students learning (RoK, 2007). This study focused on the teacher based factors affecting the performance in the public secondary schools in Baringo County.

2.7 Teacher Attitude Towards Teaching and Students' Academic Achievement

Attitude could be explained as a consistent tendency to react in a particular way-often positively or negatively toward any mater. Attitude possesses both cognitive and emotional components. Adediwura and Bada (2007), opined that attitude are important to educational psychology because they strongly influence social thought, the way an individual thinks about and process social information. If attitude has to do with the way one thinks and process social information, it goes therefore that pre-school teachers' attitude may influence their relationship with the children they handle.

Attitude may be learnt through mimicry or imitation, which also has a part to play in the teaching and learning situation. What teachers like or dislikes appreciates and how they feel about their job, the learners they teach could have a significant effect on their learners (Yara, 2009). One can say then that attitude could be one of the factors militating against the intellectual development of pre-school children. Unfortunately, many teachers seldom realize that how they teach, behave interact with learners can be more paramount than what they teach. This is to say that some teachers do not realize the fact that their attitude could have effect on the learning achievement. In respect of this, it is very obvious that investigating the teachers' attitude as determinants of pre-school children learning achievement is essential.

Teacher self-efficacy is defined in various ways with similar navigations such as "the extent to which the teacher believes he or she has the capacity to affect student performance" (Berman, McLaughlin, Bass, Pauly, & Zellman, 1977); "teachers' belief

or conviction that they can influence how well students learn, even those who may be difficult or unmotivated (Guskey & Passaro, 1994, p.4); “an individual teacher’s expectation that he or she was able to bring about student learning” (Ross, Cousins, & Gadalla, 1996, p.386); “teachers’ belief in their ability to have a positive effect on student learning”; and “personal beliefs about one’s capabilities to help students learn” (Pintrich & Schunk, 2002, p.331); and the teacher’s belief in his or her capability to organize and execute courses of action required to successfully accomplish a specific teaching task in a particular context (Tshannen-Moran, Woolfolk-Hoy, & Hoy, 1998, p.233).Teacher’s sense of efficacy has been investigated through two separate conceptual theories: Rotter’s social learning theory (1966) and Bandura’s social cognitive and self-efficacy theory (1977).

Elliott and Creswell (2002) argue that teacher commitment and engagement have been identified as amongst the most critical factors in the success and future of education. It contributes to teacher’s work performance, absenteeism, burnout, and turnover as well as having an important influence on student achievement. The professionally committed teachers take their job seriously and they get enjoyment from it (Elliott & Croswell, 2001). Among teacher behaviors that have been shown to lead to high student achievement are efficient classroom management skills, systematic teaching approaches, providing clear teaching goals, and using advance organizers (Fraser & Walberg, 2005; Skinner, Wellborn, & Connell 1990).

As Wenglinsky (2002) has suggested, a teacher cannot be determined to be qualified by checking his or her education level, years of experience, or teaching certificate. Teachers influence students through their interactions with them, especially in the

classroom. Thus, although important, teacher education level and experience only represent a portion of the ability to manage the classroom efficiently and to promote student achievement. Likewise, students' perceptions of professors' sense of humor was also reported to be positively correlated with the student ratings of teaching effectiveness (Adamson, O'kane, & Shevlin, 2005).

Another non teaching factor influencing teaching effectiveness was found to be the proximity to the teacher in the classroom (Safer, Farmer, Segalla, & Elhoubi, 2005). Accordingly the closer students were to the professor, the higher ratings they gave to their professors. In the relevant research study, it was reported that higher grades were positively correlated with higher ratings, however, the time the class was offered had no statistical significance relation to the student ratings. Wirth and Perkins (2013) indicated that teachers attitude contributed significantly to student attention in classrooms while Andesoji and Olatunbosun (2008) illustrated that student attitude was related to teacher related factors.

Attitude are mental superposition's that express the connections between situations. As defined by Bell (1978) it is "a mental and neural state of readiness organized through experience exerting a directive or dynamic influence upon the individual's response to all objects and situations with which is related". Ryan and Cooper (1984) emphasize that there are four major types of the teachers' attitude that affect teaching behavior. They are attitude towards self, attitude towards children, attitude towards peer and parents and attitude towards the subject matter.

On the attitude of school teachers towards mathematics, Majasan (1995) reveal that attitude towards mathematics grow and is acquired gradually through the students

interaction with the learning process and the curriculum. Teachers attitude are believed to be an important factor in determining the teaching and learning of mathematics. If the teachers attitude is negative towards mathematics, it may in turn affect learners learning and hence their achievement.

Cockcroft (1982) noted that there's no area of knowledge where a teacher has more influence over attitude as well as understanding of his pupils than he does in mathematics. Cockcroft goes ahead to claim that during his professional life, a teacher of mathematics may influence for good the attitude towards mathematics of several thousand young people and decisively affect many of their career choices. This indicates that teachers attitude towards mathematics has a great impact on mathematics' performance than any other area of knowledge.

In a study carried out by Waihenya in the year 2000, teachers' attitude was blamed for failure in mathematics and sciences. One student is quoted as saying that teachers identify those who like the subject and concentrate their efforts on them. They never try to change the perception of students who had negative attitude towards mathematics and who eventually fail. The teachers were also accused of not marking the books of the weak students and not punishing those who missed the lessons, which was like "institutionalizing" the students' dislike of the subject. Ryan and Cooper (1984) affirm the same when they talk of situations where teachers dislike particular students while having obvious fondness for others.

Johnson and Rising (1972) recommend that teachers be the kind of persons students accept and want to associate with. They should work with students with patience and kindness making learning mathematics a privilege and not a punishment. They should

be fair in marking and discipline. Majasan (1995) talked of compassion being one of the three aspects that a teacher should have for successful teaching. A compassionate teacher takes note of every individual and circumstances which lead him/her to see what is wrong and improve on it. This way, the teacher will help the student build confidence and loyalty to mathematics culminating to successful learning.

Griffiths (1988), on the development of attitude stated that the crucial period in developing attitude in a child seems to lie in the infant, where his first formal acquaintances with arithmetic is made, thereafter, should proceed at place commensurate with his understanding so that he is not baffled on one hand or bored on the other hand. Churchill (1958) suggested that the faulty development of concepts was probably the most likely cause of the "strong dislike and even fear" which many intelligent adults were known to manifest towards arithmetic operations. This conceptualization placed the origins of the phenomenon as far back as the infant school, where critics of the current practice asserted that while children were taught perhaps to calculate, the number understanding was rarely developed. If the young child did not grasp the significance of number operations at this stage, subsequent arithmetic lessons were only meaningless and puzzling.

Johnson (1967) noted that "it is the attitude which are built that are highly involved in the learning and retention of our subject and it is after the attitude you (teachers) build that are basis of your rank as a successful teacher". This indicates that if a student develops a positive attitude towards a given subject, then the chances of liking that subject and performing well in it are increased. Aiken (1970) studied the relationship between attitude and performance and concluded that: the relationship

between attitude and performance is certainly the consequence of reciprocal influence, in that, attitude affects achievement and in turn affects students. Mwangi (1986) had similar findings when he found out that teachers attitude was being reflected in the students poor performance.

The teacher must like subjects they teach, enjoy it because without enthusiasm it is easy for students to get bored of concepts flatly delivered (Ryan & Cooper, 1984). Pleasure in learning and teaching is the common ground necessary to sustain great teaching. If teachers like and value their subjects, this positive attitude will show through and will have a powerful influence on the motivation of students. What the teacher values, students begin to value and on to motivation will have taken root (Eble, 1988). If the teacher therefore feels little enthusiasm or interest, this too shows through and the students slows down.

Positive attitude of the teacher towards the subject plays a positive role in causing the students to learn the subject effectively and thus achieve good grades in the subject. In a conference on the low achievers of mathematics (Jonson and Rising 1972), it was noted that for successful learning, the mathematics teacher should be as follows: “A teacher who accepts the fact that low achievers are teachable; a teacher who has missionary spirit and a respect for the worth of pupils with limited ability; a teacher who is concerned and interested in individuals; a teacher who can make a pupil feel he/she is not only belongs but is important; a teacher who can instill a sense of worthiness, responsibility and desire to achieve. A teacher who cares enough to give his best to the low achiever will make the program a success”.

Gatanzamo (1977) giving his experience with prospective teachers noted that, during their first few days of classes, prospective teachers had a tendency to make one or more of the following comments: "mathematics has always been my poorest subject", or "I will never pass this course". Such comments indicated to some degree, the feelings and emotions of many of the prospective teachers towards mathematics. Unless these prospective teachers' attitude were changed, then the pupils taught by teachers with these feelings were likely to reflect the same to achieve accordingly. Parker (1974), Wamani (1980) and Thuo (1984) as in Irumbi (1990) found a strong relationship between achievement in mathematics and attitude towards mathematics. Munguti (1987) in a study of factors affecting the teaching and learning of mathematics found out that teacher attitude towards mathematics was a factor that may affect the teaching of mathematics.

Mwangi (1986) had similar findings when he found out that teachers attitude was being reflected in the students' poor performance. The teachers' attitude and effectiveness were determinant of students' attitude and performance in mathematics. Wando (1992) studied teachers as a possible source of pupils' attitude towards mathematics. She found no evidence to the effect that teachers' attitude affect pupils towards the subject. Kinyanjui (2004) argues that there is no significant relationship between the mathematics teacher's attitude student's performances in the subject whereas Margaret (2003) contradicts to conclude that a significant relationship does exist between attitude of teachers and learners performance. Owing to the fact that all these studies targeted the primary and the secondary teachers, it is worth to undertake the same research on the pre-school teachers to unearth the discrepancy since teachers' attitude towards mathematics is an important factor in learning mathematics.

A review by Baker (2006) argued that teachers' abilities to form positive relationship with students are impacted by their personality type, experiences and the quality of their own personal relationship. When students have a positive teacher – student relationship, they adjust to school more early, view school as a positive experience exhibit fewer behaviour difficulties display better social skills and demonstrate higher academic achievement (Buyse, *et al.*, 2009). A lot of teachers' characteristics are capable of influencing the pre-school children learning achievement. Such factors have been identified to include teachers' attitude, experience and motivation among others.

Adeyanju (2004) opine that a teacher whose has a positive attitude towards teaching and towards his pupils will obviously teach more effective than teacher who has develop negative attitude towards the learners he has to deal with. Teachers as a molder of lives must be embodiment of good character and virtues, who is sincere in word and acts and whose personal life sets a good example to his pupils (Ryan, 2010). Some studies have been done on teachers' attitude, teaching and learning situation. For instance, while reporting the work of Onocha, (1985), Yara (2009) reported in one of his finding that teachers' attitude toward science is a significant predictor of achievement as well as their attitude.

The negative attitude therefore jeopardizes professional standards by influencing effectiveness of teaching methods and performance of students. Teacher attitude is majorly affected by the teachers' knowledge base and mastery of the subject knowledge and the socio-cultural context, Osakwe (2000).Teacher attitude is also

associated with quality teaching and learning in the classroom, teacher who poses a negative attitude impair the ability of students to be able to receive messages from the subjects that they teach leading to wrong interpretation of concepts.

Okorodudu (2006) states that passion of positive work attitude enhancing, teaching leading to the achievement of learning objectives and the overall education objectives. Hence the need to find out if teachers' attitude determines the learning achievement of secondary school students is essential. Also Ogunwuyi (2000) found significant causal relationship between the teachers' attitude and' achievement in science. In view of this, we can say that the role of the teacher as facilitator of learning and the contributors to learners' achievement is enormous but there are few of studies on teachers' attitude as determinants of intellectual development of students.

Buddin, Zimmer, Chau, Gill and Hamilton (2009) puts it that teacher effectiveness is typically measured by traditional teacher qualification standards such as experience, education, scores in examination at pre-service training institutions. Studies in Los Angeles in Mathematics and reading in secondary schools for 5 years found no evidence that traditional measure of teacher effectiveness such as training, experience, education and scores on licencure examinations have any direct connections with students' achievement. Studies found out that teacher experience effected student achievement by less than one percentage point. Harris and Sass (2007) concluded that of all the teacher characteristics there is good evidence that teachers gain in effectiveness with additional years on the job.

Rice (2003) opined that teacher experience is strongest during the first few years of teaching; after that, marginal returns diminish Clotfelter, Ladd and Vigdor (2007)

concluded that teachers with more experience are better teachers. This is the case even after accounting for the fact that teachers who remain teachers may, on average, be less effective than those who leave. The benefit of experience peaks 21-27 years of teaching and adds 0.092 - 0.119 standard deviation to student achievement scores. More than half of that gain occurs during the first years of teaching. Sureiman (2010) in studies on" Determinants of Academic Performance in Public Day Secondary Schools in Nandi District", Kenya revealed that teachers' experience among other variables has a significant impact on academic performance of a child while Kimani, Kara and Njagi (2013) established that teacher features such as age, experience, gender, professional qualification were not significantly related to academic achievement.

2.8 Effects of Teacher Characteristics on Student Achievement

Education is widely regarded as a basic human right, a key to enlightenment, and a source of wealth and power (Mugenda & Mugenda, 1999). Education is critical to industrial and technological development, with the history of developed nations bearing records of this, developing nations aspiring to realize the same status have to put a premium. UNESCO (1986) indicates that knowledge holds key to the attainment of the millennium development goals, which include, food security, eradication of child mortality, and reduction of the spread of HIV and AIDS among others.

Researchers continue to puzzle over the relationship between teacher inputs and behaviour and students' achievement (Hill, Rowan & Ball, 2005). The measures of teacher inputs have varied widely, as have results from these investigations. Identification of teacher inputs and practices that contribute most towards improving students' achievement has often eluded researchers, even though most seem to

believe that addressing poor teaching may be the most effective means of improving school quality (Glewwer & Kremer, 2006). While numerous studies exist on the influence of specific teacher quality attributes on students' academic achievement, relatively few studies in the past twenty years have focused on exploring how teacher quality and teacher preparedness (professional development, curriculum knowledge, pedagogical knowledge and classroom management) affect students' academic achievement in secondary schools (Hill, Rowan & Ball, 2005).

Despite the importance of identifying observable characteristics that predict teacher success, researchers and educators have had difficulty identifying specific characteristics related to teacher effectiveness (Hanushek, 1986). The lack of agreement in findings has sometimes led to impassioned disagreements about interpreting research results (Krueger, 2003). Rivkin, Hanushek and Kain (2005) found that teachers in their first or second year of teaching are associated with lower student test scores in Texas, but teacher education and certification have no systematic relationship with achievement.

Rockoff (2004) reported positive impacts of teacher experience and teacher license test scores on student achievement. Studies by Rockoff and Douglas (2010) and Xu (2011) got mixed results for teacher characteristics using detailed individual-level data from elementary schools in the San Diego Unified School District. The lack of significant effects for these teacher characteristics should not be interpreted as evidence that teachers have no impact on student achievement.

Teacher quality, measured by teacher fixed effects, has an important impact on student achievement in Rockoff and Douglas (2010). In addition, Hanushek (2005) found significant impact of classroom fixed effects (combined impact of teachers and peers). Rivkin, (2005) found large effects for overall teacher effects measured at the grade level. In other words, teacher quality may be important, but it is not well captured by levels of teacher experience, certification, and education.

According to Rockoff (2004) and Rivkin (2005) there is considerable variance in the productivity of teachers. A one standard deviation increase in teacher quality is associated with a 0.1 to 0.2 standard deviation increase in student achievement. If observable characteristics that predict teacher quality can be determined, they could be used to identify the most effective candidates in the hiring process and if teacher characteristics are malleable, determining which teacher characteristics have the greatest impact on student achievement could also inform the design of teacher training programmes (Kane and Staiger, 2008).

There is little evidence that academic background, certification exam scores (Boyd, Pamela, Hamilton, Susanna and James 2006; Goldhaber, 2007), or personality characteristics (Woolfolk and Hoy 1990 and Hoy and Woolfolk, 1993) can predict students' success. The lack of evidence linking observable characteristics to teacher effectiveness is due, in part, to the fact that most research on teacher effectiveness has examined a relatively small set of teacher characteristics collected by school administrators, such as graduate education and certification.

Recent research using data not typically collected by school districts suggests that we may be able to predict teacher effectiveness. Kane, Rockoff and Staiger (2006) found out that students assigned to a teacher with higher cognitive or non-cognitive skills score about 0.03 standard deviations higher in math. Rockoff and Douglas (2010) (forthcoming) also find that students assigned to more highly ranked New York City teaching fellows score about 0.015 standard deviations higher in mathematics.

One type of study by Rivkin (2005) measures teacher quality and then relates teacher characteristics to it. It measures teacher quality as a teacher fixed effect in a student achievement equation using data where a teacher is matched to students in the various classes of a given grade she/he taught in a year or the cohorts she/he taught over various years. Studies by Irumbi (1990), Hanushek, (2005) and Rockoff (2004) follow this approach. They find that teacher quality measured in this way is reasonably stable over time. While students taught by 'high quality' teachers have significantly higher achievement, resume characteristics on which teacher compensation is based–such as teacher education, training, and experience – explain little of the variation in teacher quality.

Another type of study by Hoxby and Sonali (2010), examined the relationship between teacher characteristics and student achievement directly. Such studies have used experimental methods, mainly investigating the effect of teacher incentives. Other studies have used statistical approaches such as an instrumental variable approach (Hoxby, 2010), a value-added approach (Hanushek, 2003) or a panel data approach. The evidence from these studies is undisputed.

Ali (2009) observes that there was statistically significant relationship between teacher characteristics and student academic achievement. Adeyemi (2010) notes teacher characteristics influenced teaching and learning in classrooms. Olaleye (2011) establishes that there was relationship between teachers characteristics and pupils performance. Gravestock & Gregor-Greenleaf (2008) states that the explanations for good or poor student's academic performance have been quite exhaustive yet controversy still exists among scholars as to what contribute singly or jointly to students' poor performance. The teacher characteristics found to be dominant in cross-country studies are related to; qualification, experience, attitude and personality.

The relationship between teacher characteristics and student performance is surprisingly elusive, however. Researchers have found it difficult to find aspects of teacher training that correlate with student performance in a statistically significant way (Chingos & Peterson, 2011). Conflicting or indeterminate results occur often. Summers and Wolfe (1977) investigated the impact of teacher scores on "Philadelphia's National Teacher Evaluations" on performance amongst primary schools students in that state, finding a negative relationship between teacher performance and student scores on standardised tests.

Anderson (2000) investigates the determinants of student performance in mathematics and language in Mexico and finds a positive and statistically significant impact in both mathematics and language for teachers making use of a more interactive approach to teaching as opposed to a traditional approach in which

lessons are dominated by teachers talking and instructing (Anderson, 2000). She also finds evidence of a positive relationship between hours spent teaching and performance in both subjects (Anderson, 2000). Anderson notes that this variable is self-reported (Anderson, 2000) and may well be over- reported. However, if this is the case, it likely that the coefficient on this variables is a lower bound of the effect of time on task of student performance.

Teacher effort therefore impact positively and statistically significantly on student performance. An interesting and important result is the positive and significant impact on both language and mathematics observed for teacher training during the year in which the study was conducted (Anderson, 2000). Angrist and Lavy (2001) find positive estimates of the impact of in- service teacher training on both mathematics and language in secular primary schools in Jerusalem. They report that their results are robust to a number of estimation techniques, namely regression, difference-in-difference techniques as well as matching techniques. The fact that the effect is only observed in secular schools may be due to the fact that the training programme was introduced later and on a smaller scale in religious schools (Angrist & Lavy, 2001).

Ferguson (1998) used data from the “Texas Examination of Current Administrators and Teachers” to evaluate the impact of student performance at all levels of the schooling system. Contrary to the results obtained by Summers and Wolfe, Ferguson found a positive correlation between student performance and teacher test scores. Important to note is that Ferguson’s study aggregated data to the district

level. Hanushek, Rivkin and Taylor (1996) explain that aggregating data to a "higher" level (i.e. school, district or state level) increases the likelihood of obtaining positive results.

The relationship between teacher performance on tests in the subject they teach and student performance in that subject has also been tested extensively. Positive associations between teacher test score and student performance are observed in some studies across a range of subjects (Ehrenberg & Brewer, 1995; Hanushek, 1992; Rowan, Chiang & Miller, 1997), while others find a negative impact of teacher test scores on student outcomes (Murnane & Phillips, 1981).

It seems then that the evidence regarding the impact of teacher content knowledge on student outcomes is mixed. Results obtained for formal teacher qualifications were also mixed, with the majority of studies conducted returning indeterminate results. Amongst those that did return results, both negative and positive impacts were observed (Wayne & Youngs, 2003). The existing research therefore leaves us with few answers to questions about the relationship between teacher qualifications and student performance. Indeed, are teacher qualifications important at all?

Evidence from Pakistan suggests that teacher qualifications are indeed important for student performance. Arif and Saqib (2003) control for the individual and family characteristics of students, the characteristics of the schools they attend, geographic characteristics as well as a range of teacher characteristics and find that whether a teacher has a bachelor's degree or higher is positively and statistically significantly associated with student performance in language, mathematics and general

knowledge as well as a measure capturing performance in all three (Arif & Saqib, 2003). An earlier study conducted in Pakistan (Behrman, Kahn, Ross & Sabot, 1997) construct teacher quality indices for language and mathematics. These indices are linear functions of teacher performance on literacy or numeracy tests, educational attainment, and teaching experience and its squared term (Behrman *et al.*, 1997). Controlling for student demographic characteristics and family background, school characteristics, student-teacher ratios and student ability, they find a positive and statistically significant relationship between the teacher quality index and student performance in both numeracy and literacy (although the effect seems to be larger in literacy – an interesting result, since an effect, if observed at all, is usually stronger in the case of mathematics) (Behrman *et al.*, 1997).

Another study that finds a relationship between observable teacher characteristics and student performance was conducted by Slater, Davies and Burgess (2009) using UK data for 7 000 students (14 year olds) writing GCSE Key stage 4 examinations. Keystage 4 examinations are compulsory examinations dictating entrance to post-secondary education. These are written at age 16. Keystage 3 examinations are written at the beginning of Keystage 4 programme during the year that students turn 14 (Slater, Davies & Burgess, 2009). Keystage 3 examinations are often used as a "pre-test" measure in education research, or an as indication of prior attainment. Slater *et al.,* (2009) investigate whether the observable characteristics of teachers are correlated with measures of teacher effectiveness.

Teacher effectiveness is measured as the effect that teachers have on student performance on the examinations. The observable characteristics available are

teacher gender, age, educational attainment and teaching experience. None of these characteristics are statistically significant in explaining teacher effectiveness (Slater *et al.,* 2009). Interesting to note, however, is that Slater *et al.,* (2009) find a correlation (albeit weak) between the ability of students and teacher effectiveness, suggesting non-random allocation of students within a school. Allocating students to teachers in such a way that places less able student with more effective teachers may well enhance the positive impact of teacher effectiveness.

Raudenbush, Eamsukkawat, Di-Ibor, Kamali and Taoklam (1993) investigate whether in- service training affect student performance significantly. They measure in-service training by including a variable capturing the amount of exposure (in terms of days) of in-service training as well as a variable controlling for the number of times that teachers received internal supervision (Raudenbush *et al.,* 1993). They also include a measure of whether a teacher has a bachelor's degree. They come up with a very interesting result: although in-service training does not appear to have any significant effect on student performance, internal supervision (by the school principal or another teacher at the school) has a large and significant effect. This is in contrast to external supervision by a district official (Raudenbush *et al.,* 1993) which shows no significant impact on student performance. They explain the effect of intensive internal supervision as being as large as a teacher obtaining a bachelor's degree (Raudenbush *et al.,* 1993). It appears then that although formal in-service training does not appear to improve teacher quality, a type of mentoring and "coaching" approach does.

Results from a study conducted using Cambodian data (Marshall, Chinna, Nessay,

Hok, Savoeun, Tinon & Vaesna, 2009: 406) show positive and significant effects (as well as inequality reducing effects) on the performance of grade 6 students on language tests. High levels of mathematical content knowledge amongst teachers also showed a positive and significant effect on grade 6 mathematics performance and high levels of mathematics pedagogical content knowledge had a significant impact on grade 3 mathematics performances (Marshall *et al.*, 2009: 406). The authors did not control for formal teacher qualifications or teaching experience separate to content knowledge. Luschei and Carnoy (2010: 175) find no significant impact for teachers' postgraduate education on student performance in mathematics or language in a study conducted using Uruguayan data. Interestingly, however, high levels of teaching experience (10 years and above) are positively and significantly associated with both mathematics and language performance (Luschei & Carnoy, 2010).

Another study that finds a statistically significant relationship between teaching experience and student performance is that of Clotfleter, Ladd and Vigdor (2007). These authors use North Carolina data to investigate the relationship between teacher characteristics and student performance. Since the early 1990s, the state of North Carolina has administered standardised mathematics and reading tests to all students between grades 3 and 8 (Clotfelter *et al.*, 2007). Furthermore, it is possible to match students to their teachers for each year. The authors are able to identify the teachers of at least 75% of grade 3, 4 and 5 students in the state's education system between 1993/1994 and 2003/2004, rendering it possible for them to conduct analysis on the impact of teacher characteristics on both the levels of mathematics and English performance and the gains in performance from year to year (and therefore

controlling for various student and school-level effects, the gains that may be tentatively associated with the teacher) (Clotfelter *et al.,* 2007).

The authors find a positive and statistically significant impact for teacher experience on student performance in both mathematics and English (Clotfelter *et al.,* 2007). Teacher experience is captured by categorical variables denoting 1 to 2 years of experience, 3 to 5 years of experience, 6 to 12 years of experience, 13 to 20 years of experience, 21 to 27 years of experience and more than 27 years of experience. They therefore control for non-linear returns to teaching experience (Clotfelter *et al.,* 2007).

The returns observed are higher for mathematics than they are for English – a finding largely in line with what is found in the literature about teaching experience and student performance. The size of the coefficients indicate that the majority (or more than half) of the returns to teaching experience occur within the first two years of teaching. An issue often raised when investigating returns to teaching experience is the possibility that positive returns to experience are overstated if it

is likely that underperforming or weaker teachers will leave the profession after their initial year (Rockoff, 2004).

Clotfleter,Ladd and Vigdor(2007), tested for this possibility by adding a variable controlling for whether a teacher remained in the profession in North Carolina for at least three years. They interact it with the categorical variables controlling teachers with 1 to 2 years of teaching experience. If weaker teachers leave the profession after

their early years as teachers, a positive coefficient on the variable controlling for those who remain in the profession is expected. However, the opposite is observed. In the case of mathematics, a negative and statistically significant coefficient is observed in both the levels and gains model, suggesting that those who leave teaching are not less able than their counterparts who remain in the profession. Furthermore, the interaction term is not statistically significant in either subject, suggesting that it is not differential attrition that drives the increasing returns to teaching experience observed in the data (Clotfelter *et al.*, 2007).

"By many accounts, the quality of teachers is the key element to improving student performance" (Hanushek, 2009). The impact of being taught by a good teacher is quantified by Hanushek (2011) where he estimates that students who perform a standard deviation above average (as measured by performance on high school tests) earn between 10 and 15 percent more per annum than average – an estimate he deems conservative as it is measured in the early years of their career (before they have reached their full earning potential) and it does not account for the possibility that higher performance at high school level probably results in higher educational attainment (Hanushek, 2011). The home background and motivation of the student obviously contribute significantly to the level of success that students are able to achieve, but rigorous research has isolated the impact of effective teaching on student performance.

Hanushek (2011) reports that studies have consistently shown that high-performing teachers (performing 1 standard deviation above the mean, or at the 84th percentile of the distribution) result in student grades that are at least 0.2 standard deviations

higher at the end of a school year. Although these gains diminish over time, it is estimated (although somewhat less conclusively) that the long term benefit of being taught by an effective teacher is 70 percent of the immediate gain, and so consecutive years of high quality teachers result in student outcomes markedly higher than they would have been had students been taught by teachers at the 50th percentile of the distribution (Hanushek, 2011). It is clear that teacher quality and teacher effectiveness have a considerable effect on the lifetime earnings of students.

Evidence of the impact of teacher quality in later life also exists. Chetty, Friedman and Rockoff (2011) find evidence of fairly sizeable impacts of teacher quality on adult earnings of their students. Teacher quality (measured by value added) improves the probability of college attendance, the quality of college attended by students (measured by the earnings of former students of colleges) as well as future earnings of students (Chetty *et al.*, 2011). How then should we measure teacher quality? To what extent are we "missing the point?" An important aspect of teacher quality and teacher effectiveness to consider is the extent to which the education received by teachers is well-suited to enabling them to teach.

Literature (some of which is discussed above) shows that teaching is an attractive profession to highly able individuals endowed with skills that fetch a high price in the labour market. It is important to understand whether or not those skills are likely to translate into positive outcomes for students or whether there is "something else" required of teachers that does not necessarily guarantee that highly able individuals

was effective teachers. One way to approach this question is to investigate the specific knowledge requirements of teachers.

The National Council of Teachers of Mathematics in US (NCTM) refers to teacher's knowledge of their students as students as being central to their ability to influence their performance (NCTM, 2000). This broadly refers to teachers being able to identify "preconceptions and background knowledge that students typically bring to each subject" (National Board for Professional Teaching Standards (NBPTS), 2012: vi). This is essentially what is referred to as Pedagogical Content Knowledge (PCK) (Hill, Loewenberg Ball & Schilling, 2008). Although its importance in improving student outcomes is widely acknowledged, very little exists in the way of empirical evidence and understanding of this relationship.

Hill *et al.*, (2008) believe that this results from two factors. Firstly, there is an absence of studies that are able to prove that teachers possess such knowledge, and secondly, measures to assess programmes which aim to develop this knowledge and its impact on student achievement have not yet been developed. In the absence of such measures, it may be difficult to measure the aspect of teacher quality that truly affects student performance. Research that does investigates the type and depth of subject (and other) knowledge required to teach presents some very

important results. The mathematical knowledge required of mathematics teachers is extensive (Ball, Thames & Phelps, 2008).

The tasks involved in teaching mathematics require "significant mathematical

knowledge, skill, habits of mind and insight" (Ball *et al.,* 2008). What is referred to as *common content knowledge* is the mathematical knowledge that teachers require to perform their job. Teachers also require *specialised content knowledge* – mathematical knowledge and skills particular to teaching. This type of mathematical knowledge is not particularly useful (or even desirable) outside the context of teaching and requires a certain "unpacking" of mathematical knowledge. Examples of this kind of mathematical content knowledge would be the analysis of student errors or evaluating whether a nonstandard approach to calculation would work in general (Ball *et al.*,2008: 400).

A third domain, *knowledge of content and students*, involves understanding and therefore anticipating how students will interpret and understand the work and where they will experience difficulty (Ball *et al.,* 2008). The fourth domain, knowledge *of mathematics and teaching*, refers to an understanding of how mathematics should be taught. For example, the sequencing of topics and examples would fall under this category of mathematical knowledge (Ball *et al.,* 2008). The authors point out that the mathematical knowledge required of teachers (and indeed teachers across different fields and subjects) includes and extends beyond that of other professions requiring mathematical knowledge. This is important to acknowledge this when evaluating the importance of the profession in society.

A rare study in which the impact of different kinds of mathematics knowledge amongst teachers (based to a large extent on the findings of Ball *et al.*, discussed above) was tested amongst students attending schools in rural Guatemala (Marshall

& Sorto, 2012) presented encouraging results. Using hierarchical linear modelling, they test the impact of different kinds of teacher knowledge in different areas of mathematics performance. Interestingly, they find coefficients of very similar size to those observed in US studies. Marshall and Sorto (2012) find significant results for what they call “mathematics knowledge for teaching” (as opposed to common content knowledge and specialised content knowledge). Interestingly and importantly, the coefficients for mathematics knowledge for teaching are largest and most significant for areas of the mathematics test that have the highest degree of cognitive demand required of students (Marshall & Sorto, 2012). This makes intuitive sense – the more difficult the content, the more specialised a teacher needs to be to ensure that student learning takes place.

Akinsolu (2010) asserts that availability of qualified teachers determined the performance of students in schools. Teachers involved in in-service training were more effective in classrooms as compared to teachers who had not undergone training. Wirth & Perkins (2013) indicate that teacher’s attitude contributed significantly to student attention in classrooms whereas Adesoji & Olatunbosun (2008) illustrates that student attitude was related to teacher characteristics. This therefore meant that teacher’s attitude directly affected students’ attitude. On teacher personality, Adu & Olatundun (2007) contend that teachers’ characteristics are strong determinants of students’ performance in secondary schools.

The impact of teacher characteristics (both qualifications and demographic characteristics) is important for education policy. Ensuring that teachers best suited

and most able to enhance student performance are employed is a key responsibility for policymakers. Wayne and Youngs (2003) explain that a large body of literature about teacher characteristics and education outcomes exists. The focus on the studies varies between questions about teacher quantity and turnover and issues surrounding teacher quality. In many countries (South Africa included) certain qualifications need to be obtained before teachers are permitted to enter the teaching force. Much of the literature surrounding teacher characteristics and student performance is comprised of analyses of the impact of these and other qualifications. Attempts have been made to identify trends in the quality of teachers, and the question whether characteristics of teachers in different parts of the schooling system exist is often investigated (Wayne & Youngs, 2003).

2.9 Summary

The literature review has produced reoccurring themes on teacher related factors and students academic achievement. Studies on teacher qualification has noted positive relationship between qualification and students' academic achievement (Prieto & Altmaier, 1994; Ogundane, 2001; Commeyras, 2003 & Ijanya, 2000). These studies were conducted among secondary schools in developed countries and West Africa. Literature search reveals that there is scanty information on relationship between work experience and students academic achievement in Kenya and particularly in Baringo County.

Studies have also pointed out that there is an association between teachers experience and students' academic achievement (Hanushek & Kain, 2000; Boyd, Grossman, Lankford and Wyckoff, 2006; Ferguson 1991; Goe, 2007; Greenwald,

Hedges & Laine 1996, Loeb & Beteille, 2008; Rice, 2003; Rivkin *et al.*, 2005; Rockoff, 2004).Teacher qualification is another factor that influences achievement (Shulman, 1986; Goldhaber & Brewer, 2001; and xin *et al.*, 2004). These studies were conducted among schools in West Africa and Europe. A similar study relating instructional leadership and secondary school students' academic achievement in Baringo County has not been conducted.

Several studies indicate that teacher beliefs and capabilities bring positive effect and performance (Ross, Cousins & Gadalla,1996; and Pintrich & Schunk 2002; Fraser and Walberg, 2005; Skinner Wellborn & Connell, 1990; Free man, 1988; Adamson, Okare & Shevlin 2005; Buyse *et al.*, 2009).The above studies looked at teacher attractiveness truthworthness and student performance while other studies have shown that teacher proximity in the classroom influence effective teaching (Andesoji & Olatunbosun, 2008; Wirth & Perkins 2013). Limited studies have however been done on the teacher factors in sub-Saharan Africa (Mwamwenda *et al.*, 1989), most of studies have been done in developed countries.

Scholars and researchers generally are in agreement that the school variables, which include teacher administration, perform a critical role in educational achievement than other variables (Patrick, 2005). The important role of the teachers in the learning is unquestionable. Teachers have a lot of influence on their classroom practices. Teachers should have and apply specific abilities without which their influence may not be reflected in their students' performance in the subject. For students to be able to make connection between what is taught in school and its application in problem solving in real life, the teacher has to be effective in their teaching. There has been no

consensus on the importance of specific teacher factors, leading to the common conclusion that the existing empirical evidence does not find a strong role for teachers in the determination of academic achievement.

This study therefore sought to investigate the influence of teacher characteristics in influencing students' performance in public secondary schools in Baringo County. There is thus urgent need to put up mechanisms to reverse this state of affair. In an attempt to understand the primary root cause of this unsatisfactory performance at both primary and secondary level of education, the researcher sought to investigate the influence of teacher characteristics on the achievement of secondary school.

This study focused on correlation of teacher factors and students academic achievement for last 5 years in Baringo county in Kenya. This study may help to improve the performance of KCSE examinations, quality of the workforce and economy of the country. The findings of the study was of great benefit in planning for an appropriate human resource development in the instruction geared towards the attainment of the Goals of education, Millennium Development Goals and Vision 2030.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

The chapter presents the philosophical paradigms of the study. It then gave a description of the research design, location of the study, target population, sample size and sampling procedures and sample size. It further described the instruments of data collection and analysis procedures and concludes with a description of ethical considerations.

3.2 Research Paradigm

Research is defined as the systematic and objective process of gathering, recording, and analyzing data for purposes of aiding decision making (Lindsay, 2001). Research is a process that has three major dimensions: ontology, epistemology and methodology. Ontology refers to assumptions held about the nature of social reality (Creswell, 2009). That is whether reality is objective and external to the individual or whether it is subjective and cognitively constructed on an individual basis. Basically, one's view of reality and being is called ontology and the view of how one acquires knowledge is termed epistemology.

Ontology is the starting point which will likely lead to your own theoretical framework. Therefore ontology is defined here as the study of claims and assumptions that are made about the nature of social reality; claims about what exists, what it looks like, what units make it up and how these units interact with each other. In other words, a study on ontology is about what is meant when it is said that something exists (Lindsay, 2001). It is associated with epistemological assumptions

about the basis of knowledge and in the manner knowledge is transmitted to others (Pounder, 2003).

Whereas ontologists' study what is meant when it is said that something exists, an epistemologist studies what is meant when it is said that something is known. Epistemology is defined as the theory of knowledge embedded in the theoretical perspective and thereby in the methodology. Together, ontological and epistemological assumptions make up a paradigm (Lindsay, 2001). The term paradigm refers to an overall theoretical research framework. It is a loose collection of logically related assumptions, concepts or propositions that orient thinking and research (Lindsay, 2001).

Methodology is the means or methods of doing something. According to Burns and Grove (2003), methodology includes the design, setting, sample, methodological limitations, and the data collection and analysis techniques in a study. Tashakkori and Teddie (2003) describes methodology as coherent group of methods that complement one another and that have the ability to fit to deliver data and findings that will reflect the research question and suit the researcher purpose. According to Collinbridge (2008), methodology means a framework of theories and principles on which methods and procedures are based.

Two research approaches; qualitative and quantitative are the commonly used methods in research. Qualitative approaches involves purposeful sampling, collection of open-ended data, analysis of text or pictures, representation of information in figures and tables, and personal interpretation of the findings (Creswell, 2008).

Quantitative methods involve collecting, analyzing, interpreting, and writing the results of a study. It involves use of inferential statistics in hypothesis test. Mixed methods involves the use of a combination of qualitative and quantitative methods.

Pragmatism was generally regarded as the philosophical partner for the Mixed Methods approach. It provided a set of assumptions about knowledge and enquiry that underpins the Mixed Methods approach and which distinguishes the approach from purely quantitative approaches that are based on a philosophy of (post) positivism and purely qualitative approaches that are based on a philosophy of interpretivism or constructivism (Rallis & Rossman, 2003). The researcher adopted postpositivism paradign where the theory was adopted to guide methodology

The problems studied by postpositivists reflect the need to identify and assess the causes that influence outcomes, such as found in experiments. In this study, the relationship between teacher related factors and student achievement was studied. Postpositivist was also reductionistic in that the intent was to reduce the ideas into a small, discrete set of ideas to test, such as the variables that comprise hypotheses and research questions (Creswell, 2008). This was used to analyse inferential data and test hypothesis that there is no relationship between teacher related factors and student achievement.

The knowledge that develops through a postpositivist lens is based on careful observation and measurement of the objective reality that exists “out there” in the world. Thus, developing numeric measures of observations and studying the behavior of individuals becomes paramount for a postpositivist (Creswell, 2008). Therefore the

development of data collection instruments on competencies was informed by this Postpositivist believes.

Finally, there are laws or theories that govern the world, and these need to be tested or verified and refined so that we can understand the world. Thus, in the scientific method, the accepted approach to research by postpostivists, an individual begins with a theory, collects data that either supports or refutes the theory, and then makes necessary revisions before additional tests are made (Creswell, 2008).

3.3 Research Design

This study adopted descriptive survey design. The design enabled the researcher to describe the state of affairs as they are and report the findings (Kombo & Tromp, 2006). According to Kothari (2009), the design is an efficient method of collecting descriptive data regarding the characteristics of populations to justify current conditions and practices. The design involved gathering of facts or obtaining pertinent and precise information concerning the current status of phenomenon and whenever possible draw possible conclusions from the facts discovered (Orodho 2008).

Descriptive methods are widely used to obtain data useful in evaluating present practices and providing for decision. This method was appropriate as it gives a detailed description of the relationship between teacher related factors and student achievement in secondary schools' Baringo County which may be generalized to other parts of Kenya. Descriptive research designs are unique in the number of variables employed. Like other types of design, descriptive research includes multiple variable (Borg & Gall, 1989).

Descriptive study employed methods of analyzing correlations between multiple variables by using tests such as Spearman rank correlation, regression, or multiple regression analysis. On the other hand, descriptive research might simply report the percentage summary on a single variable. A descriptive study played an important role in educational research as it increased knowledge about what happens in schools. The design was intended to provide statistical information about relationship between teacher related factors and student achievement that may interest policy makers and educators. By involving a broad category of teachers the study fitted within the descriptive survey research design.

3.4 Study Area

The study was carried out within the Baringo County. Baringo County is located in the Northern part of the former Rift Valley Province. The study was conducted in Baringo, one of the arid and semi-arid districts in the Rift Valley Province of Kenya. It is located between latitudes 35°30' and 36°30' East and latitudes 00°10' South and 00°140' North, and covers an area of 10,949 km^2 of which about 165 km^2 is surface water. The district is hot and dry throughout most of the year. Rainfall is highly variable, with an annual mean of 635 mm, with weak bimodal peaks recorded from March to May and June to August. The average minimum and maximum temperatures are 20°C and 35°C, respectively.

The countyis characterised by bare ground and loose sandy loam soil with occasional stones on the surface. Much of the vegetation in the area is Acacia woodland. The county is inhabited by the Pokot, Tugen and Njemps communities whose major occupation is livestock keeping. The study was carried out in the Baringo county

public secondary schools, which is composed of the following six sub counties, Baringo North, Baringo Central, Marigat, Mogotio, Tiaty and Koibatek. Baringo county is bordered by Elgeiyo Marakwet, Uasin-Gishu, West Pokot, Turkana, Samburu, Laikipia and Kericho Counties.

The county has a total of 122 public secondary schools and the study used those schools who had sat for K.C.S.E exam for a consecutive period of five years which was a total of fifty five schools, with a total of 1070 teachers. Out of this a sample was selected for the study. The county was selected because of low KCSE academic achievement over the years and the challenges such as communication, infrastructure insecurity, faced by teachers in the county given that it is an ASAL region. These challenges have a bearing on attitudes and attractiveness of a workplace.

3.5 Target Population

The target population of this study was 1070 respondents from 122 public secondary schools in Baringo County. The accessible population was 122 head teachers and 948 teachers from selected schools as summarized in Table 3.1.

Table 3.1

Accessible Population of Teachers

Baringo Sub-counties	Schools	Number of Teachers
Baringo North	25	195
Baringo Central	28	305
Marigat	11	85
Tiaty	7	35
Koibatek	29	270
Mogotio	22	180
Total	**122**	**1070**

This study focussed on teachers who were directly involved in teaching. A preliminary meeting was held with senior and relevant offices at the Teachers Service Commission, after which a request for a list of secondary school teachers working in Baringo County. Therefore, 1070 teachers was considered as sampling frame for the study because they engage themselves directly in teaching.

3.6. Sampling Procedure and Sample size

Sampling is the process of selecting a given number of subjects from a defined population as representative of that population (Orodho, 2008). Sampling is that part of statistical practice concerned with the selection of individual observations intended to yield some knowledge about a population of concern, especially for the purposes of statistical inference (Mugenda and Mugenda,2008). This study employed stratified and simple random sampling procedures to select the sample.

3.6.1 Sample Size

Gay (2003) recommends that when the target population is small (less than 1000 members), a minimum sample of 20% is adequate for educational research. A sample of the teachers was obtained for the purpose of drawing conclusions about population targeted. All the 1070 teachers constituted the target population. The suitable sample does not depend on the size of the population nor does it have to include a minimum percentage of that population. The major issue in sampling is to determine samples that best represent the population so as to allow for an accurate generalization of results. Using Yamane's sample size for proportions (1967), at 95% confidence level, P = 0.05, the sample size was computed as hereunder:

$$\mathbf{n} = \frac{N}{1 + N(e)^2}$$

Where;

n = the sample size,

N = the population size,

ε= the acceptance sampling error

= 1070/1+1070(.05)^2

=1070/1+2.675

=1070/3.675

= 291 respondents

From the target population of 1070 respondents, the researcher used proportionate sampling to select 291 respondents from the six sub counties as summarized in Table 3.2. Proportionate sampling was used to determine the number of teachers in each sub county. For example, the sample size for Baringo North was determined as follows: (195 x 291)/1070. The distribution of the sample by Mogotio, Koibatek, North Baringo, South Baringo, Tiaty, and Baringo Central sub-counties are given in table 3.2.

Table 3.2

Sample Size of the Teachers

Baringo Sub-counties	**Sample size for teachers**
Baringo North	53
Baringo Central	83
Marigat	23
East Pokot	10
Koibatek	73

Mogotio	49
Total	**291**

3.6.2 Sampling Procedure

The study used stratified sampling, proportionate and simple random sampling techniques. The following sub counties in Baringo county formed the stratas; Mogotio, Koibatek, North Baringo, South Baringo, Tiaty, and Baringo Central respectively. Stratified sampling ensured that all the sub counties were included in the study. The aim of these stratification was to facilitate the generation of information from specific teacher characteristics the study focused on. The use of simple random sample to select respondents from each stratum assured that each element in the population had an equal chance of being included in the sample. Proportionate sampling was used to obtain the appropriate number of subjects drawn from each sub-county whereas simple random sampling gave all the subjects at the sub county level equal chance to participate in the study.

This study employed simple random procedure to select the teaching staff who participated in this research from 122 public secondary schools in Baringo County. Simple random sampling was used as a major sampling technique because each respondent had an equal chance of inclusion in the sample. It was appropriate because the entire population was relatively large, diverse and sparsely distributed, hence random sampling technique would help to achieve the desired objective. This technique was appropriate for the study as it was cost effective and efficient in administration. The sampling technique gave each teacher in the population an equal probability of being the sample. A simple random sample is obtained by choosing

elementary units in such a way that each unit in the population has an equal chance of being selected. A simple random sample was free from sampling bias.

3.7 Data Collection Instruments

According to Warwick and Lininger (1975), research instruments refer to the tools used in data collection. Researchers prefer using methods that provide high accuracy, generalizability and explanatory power, with low cost, rapid speed and maximum management demands and administrative convenience. Questionnaires are commonly used to obtain important information about the population. Each item in the questionnaire is developed to address a specific objective of the study. Questionnaires and content analysis were used to collect data in this research to obtain the required data from the respondents.

3.7.1 Questionnaire

According to Kombo and Tromp (2006), a questionnaire is a research instrument that obtain data from a large sample. It enabled collection of information from various schools over a short period of time. According to Kothari (2009), questionnaires are usually free from the interview bias as the answers are in respondents own words. Respondents had adequate time to give well thought out answers. Questionnaires facilitate easy and quick derivation of information within a short time (Borg and Gall, 1989). In this research open and closed- ended items were used. A set of questionnaires used for teachers.

The questionnaire had had four parts A to D. The first section was used to generate data on the profiles of the respondents while section B was for eliciting data on teachers qualification and experience. The last two sections were used to collect data

on teachers instructional leadership and their attitudes towards teaching. The items in sections C and D were close ended a five point Likert scale ranging from strongly disagree was scored one(1) and strongly agreed was awarded five(5). The closed ended questions from the questionnaire generated quantitative data. Questionnaires were administered by the researcher and his assistants to allow for clarification as situation may demand. Kombo and Tromp (2006) have argued that researchers' administered questionnaires were preferred for survey studies as it gave room for clarification and guidance to the respondents in the course of data collection.

3.7.2 Document Analysis

The content analysis was used to make inferences from documented information (Glenn, 2009). The study analyzed (KCSE) mean grade for the schools. The KCSE analysis helped to identify the grades the students attained in the national examinations for the last 5 years. The aim here was to ascertain the number of students with C+ and above the minimum university entry. Summaries of schemes of work, lesson plans, lesson attendants, records of work, syllabus coverage and student progress records were among the checklist documents required to be used in the study. The reason for these documents were to ascertain the level of teaching and learning process in the schools.

3.8 Pilot Study

Before the instruments are used for collecting data, a pilot study was carried out in West Pokot in North Rift region of Kenya (Mugenda & Mugenda,2008). This was because these schools represented the three categories of schools, which had similar characteristics to the main study. Through the pilot study, it was possible to determine whether the questionnaire provided the data required for the study . The results of the pilot study were useful in clarifying items in the questionnaire and simplifying the

instructions. It also yielded experience that was used to further refine the the questionnaire. This study also gave an elaborate picture of the respondents' attitude and any challenges that may arise during enumeration.

The purpose of the pilot was to establish the validity and reliability of the instruments. The views of the teachers was used to ascertain ambiguity nature of the items within the questionnaire and its ability to elicit the desired information. However, threats to validity and reliability in educational research can be attenuated if the researcher clearly defines his or her research problem, uses the appropriate research design, selects representative and unbiased sample, uses valid and reliable instrument for data collection, employs the appropriate statistical tools for analysis and avoids errors in interpreting the results.

3.8.1 Validity of the Instruments

Validity is the degree to which results obtained from analysis of data represents the actual phenomena under study (Kothari, 2009). Ary, Jacobs and Razavieh (2002) conceptualize validity as the extent to which theory and evidence support the proposed interpretation of test scores for an intended purpose. The foregoing suggests that validity hinges on the extent to which meaningful and appropriate inferences or decisions are made on the basis of scores derived from the instrument used in a research. Validity checks thus ensure that the instrument is not biased, the language, format and the layout of the data collection tool is appropriate (Kosomo, 2006).

The face and construct validity of the teachers questionnaire was examined by experts in the School of Education, Moi University. Construct validity is concerned with the extent to which a measure relates to other measures in a way that is consistent with the theoretically derived hypothesis (Orodho, 2008). Face validity ensures that a test

tool measures the relevant concepts. The experts who validated the instrument were given the questionnaire and the objectives of the study. The experts highlighted some of the weaknesses of the tool such as items that were not well constructed, double barreled questions and suggested ways of improving the instrument. These suggestions were incorporated in the instrument before it was used to collect data.

3.8.2 Reliability of the Instruments

Reliability refers to the measure of degree to which an instrument yields consistent results or data after repeated trials (Kothari, 2009). A reliable instrument should produce same results from similar respondents over time. For example, in the experimental and survey models of research, this would mean that if a test and a retest were carried out within an appropriate time span, then similar results would be obtained. Whiston (2005) suggests that if the reliability coefficient of an instrument is 0.7 or higher, then it is reliable. Similarly, Cohen, Manion & Morrison (2008) suggest that the reliability coefficient of an instrument must be 0.7 or higher if reliability is to be guaranteed.

The teachers questionnaire was piloted using a sample 30 teachers drawn from schools in West Pokot county with similar characteristics to schools in Baringo county. The reliability coefficient of the instrument was estimated using the Cronbach Alpha method. This method is appropriate in situations where a data collection tool is constructed using close-ended multiple choice items and is administered once (Kothari, 2004). The teachers questionnaire yielded a reliability coefficient of 0.748 and was thus considered reliable. The questionnaire was deemed reliable given that its reliability coefficient was above the recommended 0.7 threshold (Fraenkel & Wallen, 2000).

3.9 Data Collection Procedure

The researcher sought a permit to conduct the study from National Council of Science and Technology and Innovation through Moi University. Upon being granted permission, the researcher proceeded directly to the County Director of Education (CDE) Baringo County to seek permission to contact the targetted schools. The purpose of the study was explained to them and their consent to participate the study was sought. The researcher and respondents then set dates and venues for administering the questionnaires. On the material days, the researcher and his assistants explained to the respondents the modalities of filling the questionnaires and then administer them. The respondents were given adequate time to fill the questionnaires which they were expected to fill without any assistance. Filled questionnaires were collected and organized awaiting analysis. The content analysis was conducted with the asistance of the research assistants as scheduled.

3.10 Data Analysis

The purpose of data analysis was to describe, discuss, evaluate and explain the content and characteristics of collected information so as to be able to answer the research questions (Matthews and Ross, 2010). After all the data was collected, it was cleaned; this involved identification of incomplete or inaccurate responses in the research tools. The cleaned data was collated, coded and entered in the computer for analysis using the Statistical Package for Social Sciences (SPSS). The research yielded quantitative data. Quantitative techniques such as descriptive statistics and inferential statistics were used to establish relationships between variables as summarized in Table 3.3 l. Simple descriptive statistics was used to analyze quantitative data.

Quantitative data was obtained from the two sets of questionnaires and in the analysis of the data, both descriptive and inferential statistics were used, descriptive statistics included frequencies and percentages, whereas inferential statistics such as spearman's correlation coefficient and multiple regression were used to test hypothesis. Spearman's rank correlation Coefficient was used to establish the teacher factors influencing academic achievement in public secondary schools. It was appropriate to use the technique because the statements used were ordinal and interval scales. The results were presented in tabular and chart form using frequencies and percentages alongside inferential statistics. Percentages were used to determine and explain proportions. The spearman correlation was used to determine the relationship between nominal data. Hypotheses were tested using multiple regression.

Table 3.3

Summary of Methods that was used to Test the Hypotheses.

Hypothesis	Independent variable	Dependent variable	Statistics
There is no statistically significant relationship between teacher qualification and student academic achievement	Instructional leadership	Student academic achievement	Descriptive statistics Spearman's correlation
There is no statistically significant relationship between teacher qualification and student academic achievement.	Teachers' Qualification	Student academic achievement	Descriptive statistics Spearman's correlation
There is no statistically significant relationship between teachers' experience and students academic achievement	Teachers' Experience	Student academic achievement	Descriptive statistics Spearman's correlation
There is no statistically significant relationship between teachers' attitude towards teaching and student academic achievement	Teachers' attitude towards teaching	Student academic achievement	Descriptive statistics Spearman's correlation

Source: Author 2015

The study used multiple regression analysis to establish the relationship between the variables. The Researcher used multiple regression analysis statistical technique for analysing the relationship between teacher characteristcs and students achievement. Multiple regressions is an adaptable system for information examination that may be fitting at whatever point quantitative variables (dependent) is to be expected in relationship to some other elements (expressed as independent variable). Relationships may be non-direct, free variables may be quantitative and

one can expect the impacts of a single variable or various variables with or without the impacts of different variables considered, (Cohen, West & Aiken, 2003).

The regression model was:

$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \varepsilon$……..Equation 3.1

Where:

Y= Performance

$\beta 0$ = Regression Constant

$\beta_1 - \beta_4$= Coefficient of the factors

X_1= Instructional leadership

X_2= Education

X_3= experience

X_4= Attitude

ε = Error term

α =error

3.11 Ethical Consideration

The ethical issues in research that involve human subjects' have received considerable attention over the last 50 years. There are several ethical issues that must be considered when designing such studies. The primary concern of the investigator should be the safety of the research participant (Creswell, 2009). This is accomplished by carefully considering the risk/benefit ratio, using all available information to make an appropriate assessment and continually monitoring the research as it proceeds. The scientific investigator must obtain informed consent from each research participant. This should be obtained in writing (although oral consents are sometimes acceptable) after the participant has had the opportunity to carefully consider the risks and

benefits and to ask any pertinent questions. Informed consent should be seen as an ongoing process, not a singular event or a mere formality.

For purposes of the study, the researcher sought approval from Moi university to carry out the research and also obtain a research permit NACOTSI. The researcher further sought the approval from the local administration from the study area. Other ethical considerations were made during this research include; consent, privacy and safety of the subjects, respecting autonomy and treating respondents equitably. During the study all the participants were informed about its purpose and objectives. Compliance with ethical boundaries such as informed consent, respect of privacy, avoidance of harm and deception (Creswell, 2009) was guaranteed to all respondents. Respondents were also informed about the nature of the study's outputs and how the data collected will be managed during and after the project. Access to data was also restricted by keeping it under lock and key and use of passwords. Lastly the study adhered to professional research ethics to avoid unnecessary misunderstanding, conflicts and ethical misconduct.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, INTERPRETATION AND DISCUSSION

4.1 Introduction

This chapter presents the results and discussions of the study. The general objective of the study was to determine the relationship between selected teacher factors and students' academic achievement. It was guided by four specific objectives:

i. To examine the relationship between instructional' leadership and students' academic achievement.
ii. To establish the relationship between teachers' qualification and students' academic achievement.
iii. To determine the relationship between teachers experience and students academic achievement.
iv. To determine the relationship between teachers attitude towards teaching and students academic achievement.

The chapter presents the introduction on the demographic characteristics of the respondents and its relationship between teachers instructional leadership and students' academic achievement. In addition to these, are sections on relationship between teachers qualification, experience and their attitude towards teaching and students academic performance. The results given are those generated/derived from valid response as missing data was handled using Listwise deletion, which is SPSS default standard. Listwise deletion is a function in the SPSS application that automatically excludes missing or invalid data from analysis (Pallant, 2005). The

proportion of missing data excluded from analysis via listwise deletion was however not significant and did not compromise the outcomes of the study.

4.2 Background Information of the Respondent

This study covered a number of background information of the respondents, which included school of the respondent, gender of the respondents and major teaching subjects as well as the age of the respondents. The characteristics of the respondents were summarized and described.The respondents were from all the secondary school types namely national, extra-county, county and sub-county secondary schools. Kothari, (2009) posits that describing a sample gives a clear picture of its characteristics and provides evidence that it has the attributes of the population from which it was drawn .

4.2.1 The Age of the Teachers

The teachers were asked to provide information on their age. It was necessary to elicit this data because studies have consistently found that age was positively correlated to organisational commitment and job satisfaction which leads to better work performance. Majority 150 (61.7%) of the teachers were in the 25 – 34 years age bracket. The others were in the 35 – 45 years 59 (24.3%) and 29 (11.9%) above 45 years age brackets respectively. This implies that a large percent of the teachers were relatively young and energetic.The ages of the respondents are summarised in Table 4.1.

Table 4.1

The Age of the Teachers

Age of the teacher	Frequency	Percent
25 - 34 years	150	61.7
35 - 45 years	59	24.3
Over 45 years	29	11.9

Total	**238**	**97.9**

Karsh *et al.,* (2005) found that unlike younger employees, older employees displayed higher commitment and found it difficult to leave due to factors such as financial obligations to family among other things. One would therefore expect the academic performance of students taught by older teachers be high due to their commitment to work.

4.2.2 Type of School

The teachers were also asked to state the type of their schools. The distribution of the teachers by school type is summarized in Table 4.2. The results revealed all the school types were represented in the study and majority 104 (44.3%) of the teachers were drawn from Sub-Couty schools. It is important to mention here that Baringo County has only 14 (6%) national school. Although 43 (18.3%) extra-county schools are fewer compared to 74 (31.5%) county schools, these schools have superior students' enrolments. The county however, has several extra-county, county and sub-county schools.

Table 4.2

Type of Schools

School type	Frequency	Percent
National	14	6.0
Extra-County	43	18.3
County	74	31.5
Sub-County	104	44.3
Total	**235**	**100.0**

The high number of students' enrolments in extra-county schools meant that the number of teachers posted in these schools are more than those in county and sub-county schools. This partly explains why the number of respondents in extra-county

schools were almost rivaling those from county schools. According to (GOK, 2010) secondary schools in Kenya are classified as National, Extra-county, County and Sub-county.

4.2.3 Major Teaching Subjects

The teachers were further asked to indicate their major teaching subjects. The responses of the teachers are tabulated in Table 4.3. Ten subjects namely 13 (5.6%) Geography, 17(7.3%) of History, 15(6.4%) Religion, 9 (3.8%) Business Studies, 39 (16.7%) English, 16 (6.8%) Kiswahili 38 (16.2%) Mathematics, 13 (5.6%) Physics 21 (9.0%) Biology and 34 (14.5%) Chemistry were indicated by the teachers as their major teaching subjects. Subjects such as mathematics, English and Kiswahili are compulsory in all secondary schools pursuing the 8.4.4 system of education. Teachers handling these subjects are likely to be more than their counterparts handling other subjects. It is indeed apparent that majority of teachers surveyed in this study were those teaching mathematics. This was followed by English, which is also a prerequisite subject for all students at secondary school.

Table 4.3

Major Teaching Subject

Subject	Frequency	Valid Percent
Geography	13	5.6
History	17	7.3
Religion	15	6.4
Business Studies	9	3.8
English	39	16.7
Kiswahili	16	6.8
Mathematics	38	16.2
Physics	13	5.6
Biology	21	9.0
Chemistry	34	14.5
Total	**234**	**100.0**

Kiswahili teachers formed the fourth largest component of those covered in this study. Results suggest that students prefer to take chemistry if the number of teachers taking the subject is anything to by. This meant that teachers of most of the subjects that were examined at the end of the four year secondary school cycle were involved in the study.

4.3 Mean KCSE Academic Performance in Baringo County

The dependent variable during the study was the academic performance in KCSE in Baringo County. The KCSE results were provided by Directors of Studies. The students academic performance was measured using the KCSE mean grades of the schools that participated in the study for the years 2009 to 2013. The students' academic achievement was measured by the overall mean grade considered for each year, the overall mean and their standard deviations were summarized in Table 4.4. The mean grades for the years were transformed into aggregate mean (overall mean). An examination of the results showed that the KCSE mean grades ranged from 4.67 (SD = 1.08) to 5.02 (1.05) while the overall mean grade was 4.90 (SD = 0.96). This indicated that the performance of the students in Baringo County was low.

Table 4.4

Descriptive Statistics of KCSE performance for the Years 2009 to 2013

	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
				Lower Bound	Upper Bound		
2009	4.8832	.84765	.05438	4.7761	4.9903	3.92	7.54
2010	4.9916	.93591	.06004	4.8734	5.1099	4.03	8.27
2011	5.0249	1.05298	.06755	4.8918	5.1579	3.67	7.93
2012	4.9498	1.15956	.07439	4.8033	5.0963	3.50	8.00
2013	4.6740	1.08059	.06946	4.5372	4.8109	3.31	7.11
Total	**4.9049**	**1.02717**	**.02948**	**4.8471**	**4.9627**	**3.31**	**8.27**

A one-way between-groups analysis of variance was conducted to explore the variation in the academic performance between 2009 and 2013 as shown in (Table 4.5). There was a statistically significant difference $p<.05$ in academic performance in KCSE between 2009 to 2013 [F (1,1209) =4.513, p=.001]. Since the effects in performance in KCSE between 2009 to 2013 were found to be significant, it implies that the means differ more than would be expected by chance alone. School academic performance was low and teachers would be the core component of such achievement. School leadership assists in managing and shaping the flow of cultural information to support students' academic progress.

Table 4.5

ANOVA on KCSE performance

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	18.826	4	4.707	4.513	.001
Within Groups	1260.974	1209	1.043		
Total	**1279.800**	**1213**			

4.4 Relationship between Teachers Instructional Leadership and Students' Academic Achievement

The first objective was to establish the extent to which teachers instructional leadership influenced students academic performance in Baringo county. The hypothesis stated that there is no statistically significant relationship between teachers instructional leadership and students 'academic achievement. The relationship between teachers instructional leadership and students 'academic achievement was determined using the descriptive and inferential analysis.

4.4.1 Descriptive Statistics on Instructional Leadership

Teachers instructional leadership was measured using a set of 21 statements questionnaire. The respondents were requested to establish the extent they agree or disagree with statements relating to the instructional leadership using a 5 point Likert scale. The mean of each item was computed and as well as their standard deviations were summarized in Table 4.6. The results showed that the mean scores of the statements were between 2.62 (SD = 1.38) to 4.44 (SD = 0.74) whereas the overall mean was 3.37 (SD = 0.57) out of a maximum of 5. Some statements had low mean scores, an indication of weakness in instructional leadership.

Table 4.6

***Descriptive Statistics* on Instructional Leadership**

Statement n = 243	**Mean**	**Std. Deviation**
Teachers are part of the team that develops the academic calendar of their schools	4.44	0.75
Teachers influence instructional change in schools	2.92	1.09
Teachers serve as representatives of leadership building teams in schools	3.20	1.33
Teachers share their instructional strategies with colleagues to help them improve their instructional practices	2.91	1.12
Teachers function as mediators between the needs and responsibilities of school administration and their needs at the classroom level	2.81	1.10
Teachers bring school administration and teachers together to solve instructional problems	2.73	1.27
Teachers plan content delivery by preparing scheme of work/lesson plans	3.64	1.0
Teachers play a key role in availing and organizing instructional materials	3.30	1.36
Teachers are the main facilitators in the search for knowledge in a classroom	4.06	1.177
Teachers create a conducive learning environment in the classroom	2.62	1.38
Teachers facilitates content delivery during lessons	2.94	1.25
Teachers ensure learning takes place during lessons	2.77	1.22
Teachers encourage students to attend classes	2.87	1.22
Teacher instill in students a culture of learning	3.83	1.25

Teachers guide students on how to solve problems	3.76	1.27
Teachers motivate their students to excel in academic work	4.01	1.15
Teachers help student understand difficult concepts through use of demonstrations and examples	3.61	1.32
Teachers show students how to develop realistic study times and follow them	3.12	1.28
Teachers take their responsibilities of organising and administering tests and assessments seriously	3.84	1.28
Teachers significantly influence their students' academic progress	3.61	1.31
Preparing students to sit for national examinations is one of the key responsibilities of teachers	3.69	1.06
Mean	**3.366**	**.568**

Among these were; teachers create a conducive learning environment in the classroom (M =2.62, SD = 1.38), teachers to bring school administration and teachers together to solve instructional problems (M = 2.73, SD = 1.22) and ensure learning takes place during lessons(M= 2.77, SD = 1.22). However, the teachers instructional leadership was rated as fair given that its overall mean was 3.37 (SD = 0.57) out of a maximum of 5. The 22 statements used to explain teacher instructional leadership had an overall mean score of 3.37 indicating that respondents agreed on its contribution towards academic achievement. This implies that the instructional leadership was averagely rated by the respondents.

Instructional leadership is concerned with organizational management for instruction and day-to- day teaching and learning (NAESP 2001). This concurs with Farr, (2011); Spillane, (2005) and Townsend, (2010) that school leaders are action oriented and response centered can help teachers to be role models who embody values and success in teaching and learning. The instructional leadership accentuates the behavioral traits of teachers that influence students' performance. This agrees with Loeb, Elfers, and Plecki (2010) that school leaders must have or develop the

competence to become knowledgeable in instructional strategies and effective methods of content delivery.

The supervision of teachers should be viewed as instructional leadership's efforts to improve classroom management. Instructional leadership entails being responsible for developing teachers' capabilities and paying attention to administrative matters such as budgeting, building maintenance, and school nutritional programs. This level of administrative support allows principals to focus their energy and time on academic performance. This agrees with Loeb *et al.*, (2010) that school leadership comprises not only formal authority but also expert knowledge of instruction, teaching, management, and safety within schools. Supervising teaching staff and managing schools require knowledge, application, and the development of methods in instructional leadership to enhance commitment, morale, and motivation.

4.4.2 Influence of Teachers Instructional Leadership on Students Academic Achievement

The relationship between teachers instructional leadership and students academic achievement was determined by performing Spearman Correlation Coefficient test. The teacher's instructional leadership mean score and students' academic achievement overall KCSE mean grade were correlated using the Spearman Correlation. This gave a correlation coefficient (r) which showed the direction of association between the variables as summarized in Table 4.7. Spearman Correlation Coefficient was used to establish the relationship between teacher's instructional leadership and students' academic achievement. There was a positive relationship between the teachers instructional leadership and students' academic achievement ($r=.165$, $n=216$, $p<.05$).

Table 4.7

Relationship between Teachers Instructional Leadership and Students Academic Achievement

Scale		Academic Achievement
Instructional leadership	Correlation Coefficient	.165*
	p-value	.015
	N	216

*. Correlation is significant at the 0.05 level

This indicated that an increase in teacher's instructional leadership the students' academic achievement in public secondary school improved. This implies that students taught by teachers with high instructional leadership abilities tend to perform better in their academic work. Leadership is essential in improving school management and raising standards of education. The quality of education depends on the nature of leadership provided by subject teachers, his ability to control, direct and guide teachers and students. There was a positive and significant relationship between teachers' instructional leadership and students' academic achievement.

This concurs with Thakur and Thakur (2004) state that secondary school instructional leadership is major determining factor of the quality of education and school performance. Wango (2009) asserts that teachers are recruited, appointed, deployed and promoted by TSC. They are responsible for the actual implementation of school curriculum in their subject areas. As implementers of the curriculum how they deliver content and manage their classes directly affect students academic achievement. Teachers can be assigned duties of a class teacher by the head teacher. Head and assistant teachers are critical for the academic achievement of students.

In addition, schools with teachers with good leadership traits perform well in national examinations (Thakur&Thakur, 2004). They noted that such teachers have strong affective traits and cognitive analytical skills. Also it concurs with Nasongo (2009) that in order to improve academic achievement teachers must provide instructional leadership so as to manage and control their lessons well. This is because leadership is a social influence which the achievement of the desired goals.

This view is supported by Oliver and Reschly (2007) who suggested that teachers' ability to organize and manage students' behaviors would result in positive educational outcomes. Teachers' abilities to organize the classroom and manage their students' behaviors are prerequisites to effective classroom management. Teachers who are capable of managing their classroom effectively enhance learning leading to better educational outcomes. Emmer and Stough (2001) were of the view that educators who provide instructional leadership minimize disruptive classroom behaviors. Conroy, Sutherland, Snyder and Marsh (2008) found that students who are engaged in well planned and managed class are less likely to display indiscipline and bad behaviors, and this translates into good learning outcomes.

Research has shown that there is a strong association between instructional leadership and students' academic achievement (Hardman, 2011). McGuffin (2011) found out that outstanding leadership was a key characteristic of schools that perform well in examinations. They noted that instructional leadership of high achieving schools has stronger affective traits and cognitive analytical skills and were more focused. Darling-Hammond (2002), pointed out that in order to improve learning and students'

achievement, focus should be on the development of qualified and experienced teachers with strong instructional leadership abilities.

Brown, Smith & Stein (1995), posit that instruction leadership includes the teachers' ability to respond appropriately to the emotional, social, cultural, and cognitive needs of the students. Orado (2008) was of the view that in order to improve on any aspect of education, it is imperative to involve a well-articulated teacher education programme that will prepare the teachers for the leadership role they are expected to play. The Sessional Paper No.1 of 2005 (MOEST 2005) reports that there is a mismatch between the skills learned in training institutions and skills demanded in the industry and that some teachers are inadequately trained and the mechanisms for quality assurance are weak and teacher professional development is weak. The paper acknowledges that the two years training are inadequate for a trainee to acquire content mastery and pedagogical skills. It also reports that there is inadequate in-servicing of teachers. The paper proposes establishment of teacher professional development programme and regular in servicing of teachers.

A research by Hardman *et al.,* (2009) and Kisirkoi (2011) reveal that Teacher Advisory Centres (TACs) which are mandated to conduct teacher professional development tend to be ineffective. Kisirkoi (2011) further found that the Teacher Advisory Centre (TACs) in Nairobi County do not effectively conduct teacher professional development activities but engage in administrative duties of the Ministry of Education. They spend about 60% of their time performing administrative activities. No Teacher Advisory Centre (TAC) tutor had been found to have held an in-service course as ones initiative. Schools require good leaders to organize the

process of teaching and learning to ensure that the mission of the school is achieved (Lydiah & Nasongo, 2009). The core role of the instructional leader is to ensure the achievement of the established mission through creating agood environment for the schools (Lezotte, 2001).

4.5 Relationship between Teachers' Qualification and Students' Academic Achievement

The second objective of the study sought to establish the relationship between teachers' qualification and students' academic achievement. Adu and Olatundun (2007) contend that teachers' characteristics are strong determinants of students' performance in secondary schools.

4.5.1 Teacher Highest Academic Qualification

Measurement of teacher qualification using their highest academic qualification was therefore considered appropriate. The summary of the teacher's highest academic qualification is shown in table 4.8. Majority 167(70.8%) of the teachers were holders of a university degree while the others had Diploma 33(14.0%) and Masters 36(15.3%) had certificates. Further, examination of the results in the table reveals that all the teachers had the minimum qualification set by the Teachers Service Commission (TSC) for one to be a secondary school teacher (TSC, 2011). The level of education of the teachers was considered high given that 203 (86.1%) of the sample were holders of university degrees and post graduate certificates. Results showed that some teachers have over years acquired further training. This suggests that less than 1% of teachers in secondary schools were untrained.

Table 4.8

Teachers Highest Academic Qualification

Qualification	Frequency	Percentage
Diploma	33	14.0
Degree	167	70.8
Masters	36	15.3
Total	**236**	**100.0**

For instance, about 97% of teachers in public secondary were trained. However, the number of trained teachers in public secondary schools dropped by about 2% to about 95% in 2003. This drop was short lived as in the following years about 97.9% of teachers in public secondary schools were trained. The number of trained teachers in secondary schools rose from 97.9% to 99.7, and 99.8% in the year 2008, 2009 and 2010 (MOE, 2011). Akinsolu (2010) asserts that availability of qualified teachers determined the academic performance of students.

The qualification of the teachers was measured in terms of their highest academic qualification. There is no consensus among researchers on indicators of qualification. Many human resource scholars and practitioners use academic qualification as one of the major indicators of qualification (Goldhaber, 2004). Ruthland and Bremer (2002) refer to teacher qualification in two ways - traditional and alternative qualification routes. Traditional certification is when an individual completes an undergraduate degree or post graduate program in education. Alternative routes of certification are based on coursework in pedagogy and subject area without a degree in education.

Scholars such as Huang and Moon (2009) assert that teacher qualification account for approximately 40 to 60 percent of the variance in students' achievement in

assessment tests. Richardson (2008) established that students in urban areas performed better than those in rural areas and attributed this to availability of enough qualified teachers. However, in Kenya, some schools in the rural areas have performed better than their urban counterparts (Owoeye & Yara, 2011). Maundu (1986) concludes that there was significant correlation between teacher qualification and pupil performance in Kenya. The good performance was attributed to excellent instructions given by qualified teachers in addition to other inputs.

Maundu (1986) establishes that teachers who had graduated from Kenya Science Teachers College were more practically oriented than those who had degrees from public universities. While there is no comprehensive and nationwide data on the number of teachers with education levels higher than their levels of teaching, a survey of selected districts done a couple of years ago showed that 3% of the secondary school teachers surveyed had postgraduate degrees (Abuya *et al.*, 2013). This suggests that a number of teachers with the basic education level required for one to be employed as a secondary school teacher by the TSC have undergone further training .

4.5.2 Influence of Teachers Qualification on Students Academic Achievement

The relationship between teachers qualification and students' academic achievement was determined using the Spearman's Correlations (r). The Spearman's correlations is recommended if one of the variables is ordinal (ranked categorical) or not normally distributed. The results of the Spearman test between the teacher's highest qualification and students' academic achievement are summarized in table 4.9.

Table 4.9

Relationship between Teachers Qualification and Students Academic Achievement

Scale		Academic Achievement
Teachers Qualification	Correlation Coefficient	-.027
	p-value	.694
	N	216

The results of the Spearman's correlations showed that the relationship between the teachers qualification and students academic achievement in a two tail test was negative but not significant at the 0.05 level, (r= -0.027). This meant that teachers qualification do not influence students academic achievement. It has been evidenced that in many countries, teacher qualifications that are considered to be related to student learning have become desirable targets of teacher education reform. Some of these reforms call for the professionalization of teacher education by making it longer, upgrading it to graduate programs, and regulating it through mechanisms of licensure, certification, and promotion aligned with standards (Darling-Hammond *et al.*, 2001; 2002).

Findings related to teachers' academic degrees (for example; bachelors or masters among others) are inconclusive. Some studies suggest positive effects of advanced degrees (Rice, 2003; Wayne & Youngs, 2003). Some argue that the requirement of a second degree raises the cost in terms of teacher education and the time it involves and may prevent quality candidates from choosing this profession (Murnane, 1996). The results of Spearman test revealed that there was no significant relationship between the teachers qualification and students academic achievement. This argument was supported by (Ochieng, 2012) in a study titled

"Relationship between school factors and girls academic achievement in Kenya Certificate of Secondary Education Examinations (KCSE) in Kiambu East Sub County, Kenya" established that there was a weak positive relationship between teacher qualifications and girls academic achievement in mathematics that was not significant. The results contradict those of Richardson (2008) who observed that that students in urban areas performed better than those in rural areas and attributes it to availability of enough qualified teachers.

The results are contrary to those of Adeyemi (2010); Yala and Wanjohi's (2011) findings that teachers' experience and professional qualifications were the prime predictors of students' academic achievement, the study found that teachers' educational level was not statistically significant in explaining students' academic achievement. The findings therefore suggested that additional professional qualifications beyond first degree do not necessarily lead to improved competence of teaching at secondary school level. It is therefore not surprising that Ravkin *et al.,* (2005) had concluded that there was no evidence that a master's degree raises teacher effectiveness at secondary school level. It confirmed the findings of this study that there was no significant relationship between adequacy of teacher training and students' achievements, suggesting that the higher the level of training the lower the students' achievements.

4.6 Relationship between Teachers' Experience and Students' Academic Achievement

The third objective of the study sought to find out whether there was a relationship between teachers' experience and students' academic achievement. An examination

into the correlation between teachers' experience began with tracing the career path of the teachers that were covered in this survey.

4.6.1 Teaching Experience of the Teachers

The duration of teaching was another important dimension of teachers' experience that this study explored. Teachers had various years of professional teaching experience. Teachers with a minimum of five years teaching experience were the once considered in this study. This was because this study examined students' achievement from five years preceding the study. It would have been thus futile to consider teachers with less than five years of teaching experience. Teachers who have been in the teaching profession for more than five years were about 49.4% of the respondents. This was followed by teachers who have been teaching for between 6-10 years.

Teachers with 6-10 years of teaching experience constituted about 52(22.3%) of the respondents. Teachers who had been teaching for over 10 years had accounted for slightly more than 91(39%) of the study sample. Within this category those with 16-20 years of teaching were the majority, where they formed 39(16.7%) of the respondents, with those with 11-15 years were 31 (13.3%) and over 20 years accounting for 21(9%) of the respondents as summarized in Table 4.10. The results showed that majority (61.6%) of the teachers had teaching experience of 6 years and above. Only 38.6% had teaching experience of 5 years and below. It is evident that majority of the teachers had been in the teaching profession for less than five years. The importance of experience teachers in schools has been highlighted by many researchers.

Table 4.10

Teaching Experience of the Teachers

Experience	Frequency	Percentage
5 years and below	90	38.6
6-10 years	52	22.3
11-15 years	31	13.3
16-20 years	39	16.7
Over 20 years	21	9.0
Total	**233**	**100.0**

The study established that a significant number of teachers began their teaching career at levels higher or lower than their current level of teaching. Literature showed that teachers experience had a significant effect on pupil's performance in primary schools and secondary school levels (Rivers & Sanders, 2002; Clotfelter *et al.,* 2007). Experienced teachers have a richer background to draw from and can contribute insight and ideas to the course of teaching and learning, are open to correction and are less dictatorial in classroom (Kosgei *et al.,* 2013). The teachers experience was expressed by the numbers of years they have taught at the secondary school level. Adeyemi (2008) recommended use of teacher's attendance of in – service training and number of years as teacher's indicators of experience.

This agrees with Ijaiya, (2000) that experience improves teaching skills while pupils learn better at the hands of teachers who have taught them continuously over a period of years. Teachers' experience is very important because it has played a crucial role in educational attainment since teacher is ultimately responsible for translating policy into action. According to Okorji and Ogbo (2013) experienced teachers have been conceptualized as one who produces desired results in the course of his duty as a teacher. Adeyegbe (2000) posited that many students perform poor in examinations as a result of in-experience in teaching methodology and content. Supporting this point,

Oderinde (2003) remarked that teachings of students by unqualified teachers who are inexperienced in teaching methodology are among the reasons why many candidates find it difficult to pass their examinations. In order words, when inexperienced teachers handle students their learning achievement is likely to be affected negatively.

4.6.2 Influence of Teachers Experience on Students Academic Achievement

The relationship between the two constructs was determined by running the Spearman's correlations test between teachers experience and overall KCSE mean grade as summarized in Table 4.11. The results showed that the relationship between the teachers experience and students' academic achievement was positive and significant ($r= 0.272$, $p < 0.05$). This means that students taught by teachers with many years teaching experience tend to perform better in their academic work.

Table 4.11

Relationship between Teachers Experience and Students Academic Achievement

Scale		Academic Achievement
Teachers Experience	Correlation Coefficient	.272*
	p-value	.000
	N	216

*. Correlation is significant at the 0.05 level

The results of the Spearman's test showed that teachers experience influences students' academic achievement. This findings agrees with Rivkin, Hanushek and Kain, (2005) that there is a positive effects of teaching experience in relation to students' achievement are not constantly additive, but instead tend to level off after a few years. Greenwald, Hedges and Laine (1996) and Rice (2003) also have demonstrated a significant and positive relationship between teachers' number of years of experience and student achievement.

The results supported those of Blasé & Blasé, 2000 who observed that teachers' experience and educational qualifications were the prime predictors of students' academic achievement. The results were also in line with those of (Kosgei 2013) who noted that teachers' experience is a of students' performance in secondary school biology. Yala and Wanjohi (2011) also established that teachers experience positively influence students achievement. They posit that students of experienced teachers perform better because their teachers have mastered the content and acquired classroom management skills to deal with different types of classroom problems.

The results observed above were however contrary to those of Rivkin Hashunek and Kain (2005) who found that teachers' teaching experience and educational qualifications were not significantly related to students' achievement. Buddin, Zimmer, Chau, Gill and Hamilton (2009) observed that there was an insignificant relationship between teachers experience and students' academic achievement especially during the first and second year in the profession. A study by Tella (2008) also showed that teachers experience do not influence primary pupils academic performance in mathematics.

The importance of experienced teachers in schools had been highlighted by many researchers (Akinleye, 2001; Ogundare 2001). Their arguments were centred on the fact that experience improves teaching skills while pupils learn better at the hands of teachers who have taught them continuously over a period of years (Ijaiya, 2000). In general, experience and tenure are considered as essential human capital factors and affects one's productivity. The same should apply to the teaching profession. An

experienced teacher should be more familiar with the subject and have better control of students' learning than one new in the profession.

According to Ugbe and Agim (2009) experienced teachers are effective because they are able to deliver content in the most appropriate way and are able to manage students with different abilities and backgrounds. According to Khurshid, Qasmi and Ashraf (2012), teachers with more work experience have higher self-efficacy and this partly explains why the students they teach perform better. They post that self-efficacy significantly influences teacher's commitment and work performance.

Furthermore, the studies by Ilugbusi, Falola, and Daramola (2007) showed that teaching experience in schools count significantly in the determination of students' achievement in external examinations such as West Africa Senior School Certificate Examination (SSCE), National Examination Council (NECO), National Business and Technical Education Examinations and the Unified tertiary Matriculation Examination. According to them, inexperienced teachers are easily upset and destabilized by unfamiliar situations. This may imply that inexperienced teachers could get confused, mixed up the content of the topics taught to the students and hence the students will receive wrong information which would definitely lead to poor achievement among the students, while the experienced teachers are already immune to classroom provocative situations and have developed resistance and several solutions against classroom confusion and persuasion of students.

However, Ministry of education also has a clear mechanism for replacing teachers who leave through attrition. Teacher attrition results from various causes including

teachers exiting the system due to death, retirement, professional misconduct and change of career. The attrition rate of teachers was estimated to increase from 2.8 percent in 2003 to 3.3 percent in 2005, and was expected not to change much until 2015 (MOE, 2010). However, recent years has seen additional recruitment of teachers due to increased students' enrolments at secondary school level following the introduction of subsidized secondary education in early 2008. This has resulted in the entry of a large number of teachers for the last years. This explains why the number of teachers who have worked for at least five years prior to this study being numerically larger than others. In addition, the requirement of a newly employed teacher to remain in the station for five years by Teacher Service Commission (TSC) contributed also to stay of the teachers for at least five years.

4.7 Relationship between Teachers' Attitude towards Teaching and Students' Academic Achievement

The fourth objective was to establish whether there was a significant relationship between teacher's attitude towards teaching and students' academic achievement.

4.7.1 Descriptive Statistics of Teachers Attitude

Teacher's attitude was measured using a set of 22 statements questionnaire. The respondents were requested to establish the extent they agree or disagree with statements relating to the teachers attitude using a 5 point Likert scale. The mean score of the teacher's responses to the statements were computed and aggregate mean scores with their standard deviations were given in Table 4.12. From the descriptive statistics the means of the items ranged from 1.96 (SD = 1.15) to 4.24(SD = 0.81) out of a maximum of 5.

Table 4.12
Descriptive Statistics of Teachers attitude

Statement	N	Mean	Std. Deviation
Teaching is a profession that is respected by members of society	243	2.54	1.077
The profession has many avenues for career growth	243	2.62	1.11
The teaching profession is the choice of those without alternatives in life	243	3.30	1.04
The teaching profession provides teachers with the opportunity to exploit their full potential	243	2.86	1.18
Teachers consider teaching as a noble profession	241	3.40	0.99
Teachers enjoy preparing schemes of work/lesson plans	237	3.03	1.23
Availing and organize teaching materials/aids for their lessons is a challenge to most teachers	243	2.89	1.19
Teachers present the content of their lessons using a language that is easily understood by the learners	241	3.73	1.16
Teachers always use student centered approach during lessons	242	3.76	1.19
Teachers hardly use a variety of stimuli (gestures, face expression, encouraging words etc) during their lessons	240	1.96	1.15
Teachers ensure that students actively participate in class during the lesson	242	4.07	1.26
Teachers expose their students to demonstrations and practical work	242	4.05	1.07
Teachers encourage their students to participate in group discussions/symposium	242	3.92	1.15
Teachers do not guide their students on how to study on their own	242	4.24	0.81
Teachers set and administer CATs and tests to their students	242	3.85	1.46
Teacher always mark and record scores for assignments, tests and CATs	243	3.75	1.20
Teachers analyse the results of assignments, tests and CATs and discuss them with the students.	243	3.55	1.31
Teachers revise assignments, tests and CATs with the students	243	3.77	1.04
Teachers use feedback from the students to improve their teaching	242	4.17	1.08
Teachers never motivate learners in class	243	4.00	0.20
Teachers do not demonstrate to students the correct ways to solve problems	243	3.62	1.48
Teachers prepare students well to sit for national examinations	243	4.12	1.10
Overall mean	**243**	**3.50**	**0.39**

The means of all the statements were above 3 except three. The overall mean (M = 3.50, SD = 0.39) was also high, an indication that the teachers attitude towards teaching was positive. From the 22 statements used to explain teacher attitude had an overall mean score of 3.50 indicating that respondents agreed on its contribution towards academic achievement. This implies that the teacher attitude was averagely rated by the respondents. Attitude are formed as a result of some kind of learning experience. It may also be learned simply by following the example or opinion of teacher. Attitude possesses both cognitive and emotional components. This agrees with Adediwura and Bada (2007), opined that attitude are important to educational psychology because they strongly influence social thought, the way an individual thinks about and process social information.

Teacher's attitude towards teaching can make a positive difference to the lives of their students (Kosgei *et al.*, 2013). Teachers with positive attitude are caring, kind and sensitive to the diversity of their students (Kosgei *et al.*, 2013). They stimulate student's creativity and provide them with meaningful learning experiences thus enhancing learning outcomes such as academic achievement. Wirth and Perkins (2013) indicated that teacher's attitude contributed significantly to student attention in classrooms whereas Adesoji and Olatunbosun (2008) illustrate that student attitude are related to teacher characteristics.

This agrees with Adeyanju (2004) that a teacher whose has a positive attitude towards teaching and towards his pupils will obviously teach more effective than teacher who has develop negative attitude towards the learners he has to deal with. Also Ryan, (2010) argues teachers as a molder of lives must be embodiment of good character

and virtues, who is sincere in word and acts and whose personal life sets a good example to his pupils Unfortunately, many teachers seldom realize that how they teach, behave interact with learners can be more paramount than what they teach. This is to say that some teachers do not realize the fact that their attitude could have effect on the learning achievement. In respect of this, it is very obvious that investigating the teachers' attitude as determinants of pre-school children learning achievement is essential.

4.7.2 Influence of Teachers Attitude towards Teaching and Students Academic Achievement

The relationship between teacher's attitude and students' academic achievement was determined using the Spearman's Correlations (r). The results of the Spearman test between the teacher's highest qualification and students' academic achievement are summarized in Table 4.13. The results of the Spearman's correlations showed that there was significant relationship between the teachers attitude and students' academic achievement ($r= 0.153$, $P<0.05$). This was an indication that teachers attitude towards teaching has a significant effect on students' academic achievement.

Table 4.13

Relationship between Teachers Attitude towards Teaching and Students Academic Achievement

Scale		Academic Achievement
Teachers Attitude	Correlation Coefficient (r)	.153*
	p-value	.024
	N	216

*. Correlation is significant at the 0.05 level (2-tailed).

The results of the Spearman's correlations test indicated that teachers 'attitude towards teaching influences students' academic achievement. This concurs with Baker (2006) argued that teachers' abilities to form positive relationship with students are impacted by their personality type, experiences and the quality of their own personal relationship. Also (Buyse, *et al.,* 2009) that students have a positive teacher – student relationship, they adjust to school more early, view school as a positive experience exhibit fewer behaviour difficulties display better social skills and demonstrate higher academic achievement.

A lot of teachers' characteristics are capable of influencing the pre-school children learning achievement. Such factors have been identified to include teachers' attitude, experience and motivation among others. Adeyanju (2004) opine that a teacher whose has a positive attitude towards teaching and towards his pupils will obviously teach more effective than teacher who has develop negative attitude towards the learners he has to deal with. Teachers as a molder of lives must be embodiment of good character and virtues, who is sincere in word and acts and whose personal life sets a good example to his pupils (Ryan, and Deci 201). Some studies have been done on teachers' attitude, teaching and learning situation. For instance, while reporting the work of Onocha, (1985), Yara (2009) reported in one of his finding that teachers' attitude toward science is a significant predictor of achievement as well as their attitude.

Osakwe (2000) identify negative attitude therefore jeopardizes professional standards by influencing effectiveness of teaching methods and performance of students. Teacher attitude is majorly affected by the teachers' knowledge base and mastery of

the subject knowledge and the socio-cultural context. Teacher attitude is also associated with quality teaching and learning in the classroom, teacher who poses a negative attitude impair the ability of students to be able to receive messages from the subjects that they teach leading to wrong interpretation of concepts.

Okorodudu (2006) states that passion of positive work attitude enhancing, teaching leading to the achievement of learning objectives and the overall education objectives. Hence the need to find out if teachers' attitude determines the learning achievement of secondary school students is essential. Also Ogunwuyi (2000) found significant causal relationship between the teachers' attitude and' achievement in science. In view of this, we can say that the role of the teacher as facilitator of learning and the contributors to learners' achievement is enormous but there are few of studies on teachers' attitude as determinants of intellectual development of students.

The results supported those of Wirth and Perkins (2013) who indicated that teacher's attitude contributed significantly to student attention in classroom while Adesoji and Olatunbosun (2008) observed that student academic achievement was related to teacher related factors such as qualification, attitude and experience. Freeman (1988) asserted that professors' attractiveness, trustworthiness, and expertness influence teaching effectiveness. Likewise, students' perceptions of professors' sense of humor was also reported to be positively correlated with the student ratings of teaching effectiveness and performance (Adamson, O' Kane, & Shevlin, 2005).

Baker (2006) argued that teachers' abilities form positive relationship with students are impacted by their personality type, experiences and the quality of their own

personality. When students have a positive teacher – student relationship, they adjust to school more early, view school as a positive experience, exhibit fewer behaviour difficulties, display better social skills and attain higher academic achievements (Buyse, *et al.,* 2009). Kibe *et al.,* (2008) stipulated that for teaching and learning of science to be interesting and stimulating, there has to be motivation on the part of both the teacher and the learner so as to ensure the development of positive attitude and subsequently maximum academic achievement.

Teaching using methods that require students to listen, read and regurgitate depicts negative attitude to teaching. Several research findings have confirmed the hypothesis that teachers' attitude either towards science or towards science teaching affect their students' achievement towards science. Alao and Adeleke (2000) found that the effect of teachers' attitude towards assessment practices on students' achievement and their attitude towards mathematics was positive. Aduda (2005) found that teachers' attitude towards mathematics teaching is one of the major contributors towards explaining the variance in students' cognitive achievement. Mutahi (2008) confirmed that teachers' attitude towards Integrated Science teaching affect their students' attitude to and achievement in the subject while Balozi (2004) found significant causal relationship between the teachers' attitude and students' achievement in Integrated Science.

Njuguna (2005) was of the opinion that the success of our science programme depends greatly on the classroom teacher as he is the one that syntheses, translates and disseminate all our thoughts into action. Waititu (2008) said that no matter what amount of resources we might put into the nation's education system, without properly prepared and motivated teachers, we can never expect from the system.

Orado (2008) considered teachers to be effective when their teaching lead to learning and this happens when the teacher succeeds in causing a change in behaviour in the learner.

Good and Brophy (2003) noted that efficacy may influence student achievement through teacher persistence. Teachers with high efficacy take responsibility for student learning and may view student failure as a push for greater effort to improve achievement. These teachers spend more time monitoring and working with their students (through whole-group instruction, for example), providing the means for higher levels of student engagement. Efficacious teachers are more likely to develop positive teaching attitude and implement instructional strategies to enhance student learning, rather than just covering the curriculum. They also take more risks and have confidence in overcoming classroom challenges which contributes to higher student achievement (Good & Brophy, 2003).

According to Hoy (2000), pre-service teachers with a low sense of teacher efficacy have an orientation toward control, take a pessimistic view of students' motivation, and rely more on strict classroom regulations, extrinsic rewards and punishments to make students study. Teachers who lacked a secure sense of teacher efficacy were reported to "show weak commitment to teaching, spend less time in subject matters in their areas of perceived inefficacy and devote less overall time to academic matters" (Bandura, 1995, p. 20). Teachers' efficacy beliefs have also been studied with reference to their behavior in the classroom which in turn helps students' academic growth. Efficacy influences the effort teachers invest in teaching, the goals they set for their classes, and their level of aspiration (Ware & Kitsantas, 2007). Efficacy

beliefs influence teachers' persistence when things do not go smoothly and enhance their resilience in the face of setbacks (Tschannen-Moran & Hoy, 2001).

4.8 Correlation between Teacher Characteristics and Student Academic Achievement

Spearman's rhombus correlation was used to establish the correlation between teacher characteristics and student academic achievement as summarized in Table 4.14. There was a positive relationship between the attitude ($r=.153$, $n=216$, $p<.05$), instructional leadership ($r=.165$, $n=216$, $p<.05$) and experience ($r=.272$, $n=216$, $p<.05$) on student academic achievement. However there no significant relationship between the highest education level of the teacher ($r=-0.027$, $n=216$, $p<.05$), and student academic achievement. This indicated that an increase in teacher's attitude, instructional leadership and experience the student academic achievement in public secondary school improved.

Table 4.14

Spearman's rho Correlation

		Performance	Highest level of education	Experience	Instructional leadership	Attitude
Performance	Correlation Coefficient	1.000				
	Sig. (2-tailed)	.				
Highest level of education	Correlation Coefficient	-.027	1.000			
	Sig. (2-tailed)	.694	.			
Experience	Correlation Coefficient	.272**	.209**	1.000		
	Sig. (2-tailed)	.000	.002	.		
Instructional leadership	Correlation Coefficient	.165*	-.029	-.021	1.000	
	Sig. (2-tailed)	.015	.676	.762	.	
Attitude	Correlation Coefficient	.153*	-.068	.080	.101	1.000
	Sig. (2-tailed)	.024	.318	.243	.140	.

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
c. List wise N = 216

The more the teacher has the highest level of education does not significantly influence the student academic achievement in public secondary school. This agrees with Mc Guffin (2011) that leadership is also crucial for the success of schools. Schools which perform well are led by principals and subject teachers who have the ability to set pace, lead and motivate staff and students to perform to their highest potential. Thakur and Thakur (2004) posit that leadership is a major determining factor of the quality of education and school performance.

The quality of education depends on the nature of leadership provided by the school principal, his/her ability to control, direct and guide teachers and students. The findings agree with (Leithwood & Beatty, 2007; Leithwood *et al.,* 2008; Matthews & Sammons, 2005; Riley & McBeath, 2003) that an increased teacher participation in schools has the potential for significant positive effects on school improvement including students' academic achievement. This agrees with Stumbo and McWalters (2010) that effective leadership facilitates the emergence of manageable and sustainable effort when teachers and principals work with students to help them to achieve academic success.

This agrees with According to Rockoff (2004) and Rivkin (2005) that there is considerable variance in the productivity of teachers. There is little evidence that academic background, certification exam scores Boyd, Pamela, Hamilton, Susanna and James (2006) and Goldhaber, (2007), or personality characteristics (Woolfolk and Hoy 1990 and Hoy and Woolfolk, 1993) can predict students' success. This agrees with Wenglinsky (2002) that a teacher cannot be determined to be qualified by checking his or her education level, years of experience, or teaching certificate. Teachers influence student's academic achievement through their interactions with them, especially in the classroom. Thus, although important, teacher education level and experience only represent a portion of the ability to manage the classroom efficiently and to promote student achievement.

The findings agrees with Rowan, (2002) that the effects associated with teacher's possession of an advanced degree are strikingly counterintuitive; especially given the salary incentives offered to encourage teachers pursue graduate degrees. Woolfolk and Wayne (1990) also did not establish any benefits for students of teachers with

advanced degrees. The teachers with master's degrees and beyond may negatively influence their students' achievement. Xu, Jane and Colin (2011) indicated that there is no association between teachers holding master's degrees and fourth-through eighth grade student's mathematics test score gains.

However, the result showed that teacher's experience predicts children learning achievement. This is in agreement to the finding reported by Adeyemi (2008) who established a significant relationship between teacher's experience and pupils' academic performance. The reason for this result may be that, among teacher's, there was experience that might likely enhanced the learning achievement of pre-school teacher. The findings agree with Adeyegbe (2000) that many students perform poor in examinations as a result of in-experience in teaching methodology and content. Also concurs with Oderinde (2003) that teachings of students by unqualified teachers who are inexperienced in teaching methodology are among the reasons why many candidates find it difficult to pass their examinations.

The inexperienced teachers handle students their learning achievement is likely to be affected negatively. It is therefore, very important to research into the teachers' experience on the learning achievement among secondary school students. This finding also agrees with Darling-Hammond and Bransford (2005) that teacher quality depend on the knowledge and experience applied effectively to exhibit knowledge about teaching and learning. Also agrees with Smith & Gerard (2005) and Walsh, (2001) that teacher quality is his/her ability to impact student learning. This has more to do with the teacher's verbal ability or cognitive ability than with the ability of a teacher to pass some tests to obtain teacher certification (Walsh, 2001).

4.8.1 Multiple Regression Analyses

Multiple regression analysis was used to explore the relationship between one continuous dependent variable and a number of independent variables or predictors. Multiple regression was based on correlation and but allowed for a more sophisticated exploration of the interrelationship among a set of variables. This made it ideal for the investigation of more complex relationships.

Test for Multicollinearity

Collinearity diagnostics were performed on the variables before conducting the regression analysis. Tolerance tests and Variance Inflation Factor (VIF) statistics were used to check whether there was collinearity (Table 4.17). Tolerance is an indicator of how much variability of a specified independent is not explained by the other independent variables in a model. If this value is very small (less than .10), it indicates that the multiple correlation with other variables is high, suggesting presence of multicollinearity. The VIF (Variance inflation factor) is the inverse of Tolerance value. VIF values above 10 indicates predence multicollinearity. The VIF values observed during this study were all below 10 and tolerance statistics were all well above 0.2. This is an indication of absence of collinearity among the variables (Bowerman & O'Connell, 1990).

Multiple Regression analysis was carried out using a model, which combines selected independent variables and dependent variables. The academic achievement was dependent variable, while variables such as teacher factors such as attitude, highest level of education, instructional leadership, experience representing the independent factors. R^2 represents the values of multiple correlation coefficients between the

predictors used in the model and the academic achievement in public secondary schools. All the predictors used in the model represent only a simple correlation between the predictors and factors to be considered for the academic achievement in public secondary schools.

The R^2 represented the measure of variability in academic achievement in public secondary schools that is accounted for by the predictor's attitude, highest level of education, instructional leadership, experience as (independent variables). From the model, (R^2 = .148) shows that all the predictors account for 14.8% variation for the academic achievement in public secondary schools (Table 4.15). Therefore, the predictors used in the model have captured the variation in the academic achievement in public secondary schools. The weak significant effects for these teacher characteristics should not be interpreted as evidence that teachers have no impact on student achievement.

Table 4.15:

Model Summary of Student Academic Achievement

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.385[a]	.148	.132	.78039	.148	9.167	4	211	.000

a. Predictors: (Constant), Attitude, Highest level of education, Instructional leadership, Experience

This findings agrees with Hill, Rowan and Ball (2005) that researchers continue to puzzle over the relationship between teacher inputs and behaviour and students' achievement. The measures of teacher inputs have varied widely, as have results from these investigations. Identification of teacher inputs and practices that contribute most

towards improving students' achievement has often eluded researchers, even though most seem to believe that addressing poor teaching may be the most effective means of improving school quality (Glewwer & Kremer, 2006). This finding agrees with Rockoff and Douglas (2010) that teacher quality, is measured by teacher fixed effects and has an important impact on student achievement. In addition, Hanushek (2005) found significant impact of classroom fixed effects (combined impact of teachers and peers). Rivkin, (2005) found large effects for overall teacher effects measured at the grade level. In other words, teacher quality may be important, but it is not well captured by levels of teacher experience, certification, and education.

The adjusted R^2 gave the idea of how well the model generalizes the prediction of the academic achievement in public secondary schools by the independent variables. The value of adjusted R^2 was .132, showing that the prediction of the academic achievement in public secondary schools account for approximately 13.2% less variance. The change statistics were used to test whether the change in adjusted R^2 is significant using the F ratio. The model caused adjusted R^2 to change from zero to . 148 and this change gave rise to an F ratio of 9.167, which is significant at a probability of .05.

Analysis of Variance

The analysis of variance was used to test whether the model could significantly fit in predicting the outcome than using the mean as shown in (Table 4.16). The F- ratio represents the ratio of improvement in prediction that results from fitting the model, relative to the inaccuracy that exists in the model. The F- ratio was 9.167 which is likely to happen by chance and was significant (P<.05). The model significantly improved the ability to predict the academic achievement in public secondary schools.

Table 4.16:

***ANOVA* on Student Academic Achievement**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	22.332	4	5.583	9.167	.000[b]
	Residual	128.502	211	.609		
	Total	**150.833**	**215**			

a. Dependent Variable: Performance
b. Predictors: (Constant), Attitude, Highest level of education, Instructional leadership, Experience

Coefficients of Student Academic Achievement

Table 4.17 shows the estimates of β values and gives an individual contribution of each predictor to the model. The β value explains about the relationship between the academic achievements in public secondary schools with each predictor. The positive β values indicate the positive relationship that exists between the predictors and the outcome. The β value for attitude, instructional leadership, and experience had a positive coefficient thus positive relationship with the academic achievements in public secondary schools, while highest level of education was negative as summarized in the model below. The model was then specified as:

Academic achievement = 2.34 - 035Ed+.173Ex+.304IL+.358At+α…….Equation 4.1

Where:

At=Attitude

IL=Instructional leadership

Ex= experience

Ed= Education

α =error

The t test was used as a measure to identify whether the predictors were making a significant contribution to the model. When the *t*-test associated with β values is significant and the predictor is making a significant contribution to the model. The smaller the value of significance (the larger the value of t) that is the greater is the contributor of that predictor (Table 4.17).

Table 4.17:

Coefficients of Student Academic Achievement

Model		Un standardized Coefficients		Standardized Coefficients	T	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	2.341	.677		3.455	.001					
	Highest level of education	-.035	.101	-.023	-.346	.729	.015	-.024	-.022	.951	1.051
	Experience	.173	.040	.281	4.309	.000	.284	.284	.274	.949	1.054
	Instructional leadership	.304	.093	.208	3.258	.001	.218	.219	.207	.987	1.013
	Attitude	.358	.179	.129	2.003	.046	.179	.137	.127	.972	1.029

a. Dependent Variable: Performance

From the study findings the teacher attitude (β=.358, P<.05); instructional leadership (β=.304, P<.05); experience (β=.173, P<.05) and highest level of education (β=.035, P>.05) had varied influence on academic achievements in public secondary schools. The findings showed that attitude, instructional leadership and experience had significant relationship with academic achievements in public secondary schools. However the highest level of education had no significant negative relationship with academic achievements in public secondary schools.

This results concurs with Hill, Rowan & Ball (2005) that with the numerous studies on the influence of specific teacher quality attributes on students' academic achievement, relatively few studies in the past twenty years have focused on exploring how teacher quality and teacher preparedness (professional development, curriculum knowledge, pedagogical knowledge and classroom management) affect students' academic achievement in secondary schools. In addition, the β coefficients for each independent variable generated from the model was subjected to a t-test, in order to test each of the hypotheses under study. The regression results showed that each of the predicted parameters in relation to the independent factors were significant except education of the teachers.

The findings showed that $\beta 1 = 0.304$ ($p < 0.05$) which indicates that we reject the null hypothesis stating that there is no significant relationship between teachers instructional leadership and student academic achievement. This implies that for each unit increase in teachers instructional leadership there is a rise of 0.304 in student academic achievement. This agrees with Musungu and Nasongo (2008) that the instructional leadership depends on the frequency of teacher's supervision of classroom activities, involvement in tuition, revision, pupils' homework, testing and team building contribute towards students' academic performance. This agrees with Mc Guffin (2011) that leadership is crucial for the success of schools.

This concurs with Lydiah and Nasongo, (2009) that schools which perform well are led by principals and subject teachers, who have the ability to set pace, lead and motivate staff and students to perform to their highest potential. Schools require good leaders to organize the process of teaching and learning to ensure that the mission of the school is achieved. Thakur and Thakur (2004) posit that leadership is a major determining factor of the quality of education and school performance.

The findings also showed that $\beta 2 = -0.035$ ($p > 0.05$) which indicates that we accept the null hypothesis stating that there no significant relationship between teacher qualification and student academic achievement. This implies that for each unit increase in teacher qualification, there are 0.035 non-significant decreases in student academic achievement in public secondary schools.

The finding concurs with Adeyemi (2010); Yala and Wanjohi (2011) findings that teachers' experience and professional qualifications were the prime predictors of students' academic achievement, the study found that teachers' educational level and teaching experience were not statistically significant in explaining students' academic achievement. The findings therefore suggest that additional professional qualifications beyond first degree do not necessarily lead to improved competence of teaching at secondary school level. It is therefore not surprising that Ravkin et al (2005) had concluded that there was no evidence that a master's degree raises teacher effectiveness at secondary school level. This agrees with Hanushek, (1986) that despite the importance of identifying observable characteristics that predict teacher success, researchers and educators have had difficulty identifying specific characteristics related to teacher effectiveness.

On hypothesis three, $\beta 3 = 0.173$ ($p < 0.05$) which indicates that we reject the null hypothesis stating that there is no significant relationship between teacher experience and student academic achievement. This implies that for each unit increase in teacher experience there is significant 0.173 increase in student academic achievement in public secondary schools. The significant relationship between teachers' attitude, experience agrees with Ogunwuyi (2000) and Adeyemi (2008) who found that teacher's experience had significant relationship with pupils' academic achievement. The facilitate children intellectual development because teachers that are well

motivated in terms of incentive are likely to display good attitude towards the teaching of and this could in turn influence the learning achievement. This concurs with Rockoff (2004) who reported positive impacts of teacher experience and teacher license test scores on student achievement.

These findings are similar with Rivkin, Hanushek and Kain (2005), that teaching experience, have positive effects on students' achievement. This concurs with Rice (2003) who demonstrated a significant and positive relationship between teachers' number of years of experience and student achievement. This concurs with Boyd, Grossman, Lankford, Loeb and Kain, (2005) that the teachers' effectiveness in improving student achievement appears to increase most with the years of teaching. This finding supports Rivkin, Hanushek and Kain (2005) that teachers in their first or second year of teaching are associated with lower student test scores in Texas, but teacher education and certification had no systematic relationship with achievement. The findings concurs with Akinsolu (2010) that availability of qualified teachers determined the performance of students in schools.

On hypothesis four, it showed that $\beta 4 = 0.358$ ($p < 0.05$) which indicates that we reject the null hypothesis stating that there is significant relationship between teachers' attitude and students' academic achievement. This implies that for each unit increase in teachers' attitude, there is significant rise of 0.358 in student academic achievement in public secondary schools. The result reveals that, there is significant contribution of teachers' attitude and learning achievement. The result is similar to Adedeji (2008) who reported that teacher's attitude had significant relationship with pupils learning achievement. This agrees with Wirth & Perkins (2013) that teacher's

attitude contributed significantly to student attention in classrooms, whereas Adesoji & Olatunbosun (2008) illustrates that student attitude was related to teacher characteristics. This therefore meant that teacher's attitude directly affected students' attitude.

On teacher personality, Adu & Olatundun (2007) contend that teachers' characteristics are strong determinants of students' performance in secondary schools. This finding agrees with Elliott and Creswell (2002) that teacher commitment and engagement have been identified as amongst the most critical factors in the success and future of education. Teacher attitude contributes to teacher's work performance, absenteeism, burnout, and turnover as well as having an important influence on student achievement. The professionally committed teachers take their job seriously and they get enjoyment from it (Elliott & Croswell, 2001). This agrees with Fraser & Walberg, (2005) that teacher behaviors that have been shown to lead to high student achievement are efficient classroom management skills, systematic teaching approaches, providing clear teaching goals, and using advance organizers.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the study, the conclusions drawn from the findings and makes recommendations on what need to be done to enhance work performance of teachers. It also gives suggestions for further research.

5.2 Summary of the Findings

The main purpose of this study was to investigate the relationship between selected teacher factors and students' academic achievement in public secondary schools in Baringo County. The study was guided by four specific objectives. The students' academic performance showed that the KCSE mean grades ranged from 4.67 to 5.02 while the overall mean grade was 4.90. This indicated that the performance of the students in Baringo County was low. There was a statistically significant difference $p<.05$ in academic performance in KCSE between 2009 and 2013 [F (1, 1209) =4.513, p=.001].

5.2.1 Relationship between Teachers Instructional Leadership and Students' Academic Achievement

The first objective was to establish the extent to which teacher's instructional leadership influenced students' academic performance in Baringo County. The results showed that teachers create a conducive learning environment in the classroom, headteachers brought school administration and teachers together to solve instructional problems and ensure learning takes place during lessons. The teacher instructional leadership had an overall mean score of 3.37 indicating that respondents agreed on its contribution towards academic achievement. The instructional

leadership was averagely rated by the respondents. The school leaders are action oriented and response centered can help teachers to be role models who embody values and success in teaching and learning. The instructional leadership accentuates the behavioral traits of teachers that influence students' performance. The school leaders must have or develop the competence to become knowledgeable in instructional strategies and effective methods of content delivery. The supervision of teachers should be viewed as instructional leadership's efforts to improve classroom management. The level of administrative support allows principals to focus their energy and time on academic performance. Supervising teaching staff and managing schools require knowledge, application, and the development of methods in instructional leadership to enhance commitment, morale, and motivation.

Spearman Correlation Coefficient was used to establish the relationship between teacher's instructional leadership and students' academic achievement. There was a positive relationship between the teachers instructional leadership and students' academic achievement ($r=.165$, $n=216$, $p<.05$). This indicated that an increase in teacher's instructional leadership the students' academic achievement in public secondary school improved. This implies that students taught by teachers with high instructional leadership abilities tend to perform better in their academic work. A strong association existed between instructional leadership and students' academic achievement and that an outstanding leadership was a key characteristic of schools that perform well in examinations. In order to improve learning and students' achievement, focus should be on the development of qualified and experienced teachers with strong instructional leadership abilities.

Leadership is essential in improving school management and raising standards of education. The quality of education depends on the nature of leadership provided by subject teachers, his ability to control, direct and guide teachers and students. The secondary school instructional leadership is major determining factor of the quality of education and school performance. Teachers are responsible for the actual implementation of school curriculum in their subject areas. As implementers of the curriculum how they deliver content and manage their classes directly affect students' academic achievement. Teachers can be assigned duties of a class teacher by the head teacher. Head and assistant teachers are critical for the academic achievement of students. In order to improve academic achievement teachers must provide instructional leadership so as to manage and control their lessons well. This is because leadership is a social influence which the achievement of the desired goals.

The instruction leadership includes the teachers' ability to respond appropriately to the emotional, social, cultural, and cognitive needs of the students. Orado (2008) was of the view that in order to improve on any aspect of education, it is imperative to involve a well-articulated teacher education programme that will prepare the teachers for the leadership role they are expected to play. The Sessional Paper No.1 of 2005 (MOEST 2005) reports that there is a mismatch between the skills learned in training institutions and skills demanded in the industry and that some teachers are inadequately trained and the mechanisms for quality assurance are weak and teacher professional development is weak. The core role of the instructional leader is to ensure the achievement of the established mission through creating a good learning environment in the schools.

5.2.2 Relationship between Teachers' Qualification and Students' Academic Achievement

The second objective of the study sought to establish the relationship between teachers' qualification and students' academic achievement. Majority 167(70.8%) of the teachers were holders of a university degree, while the others had Diploma 33(14.0%) and Masters 36(15.3%) had certificates. All the teachers had the minimum qualification set by the Teachers Service Commission (TSC) for one to be a secondary school teacher (TSC, 2011). The level of education of the teachers was considered high given that 203 (86.1%) of the sample were holders of university degrees and post graduate certificates. Results showed that some teachers over the years acquired further training. The availability of enough qualified teachers must have been a determinant for students' performance. There was significant correlation between teacher qualification and pupil performance in Kenya. The good performance was attributed to excellent instructions given by qualified teachers in addition to other inputs. A number of teachers with the basic education level required for one to be employed as a secondary school teacher by the TSC have undergone further training.

The results of the Spearman's correlations showed that the relationship between the teachers qualification and students academic achievement was negative but not significant at the 0.05 level, (r= -0.027). This indicated that teachers qualification do not influence students' academic achievement. Findings related to teachers' academic degrees (for example; bachelors or masters among others) are inconclusive. The requirement of a second degree raises the cost in terms of teacher education and the time it involves and may prevent quality candidates from choosing this profession. The study found that teachers' educational level was not

statistically significant in explaining students' academic achievement. Additional professional qualifications beyond first degree do not necessarily lead to improved competence of teaching at secondary school level. Thus there was no evidence that a master's degree raises teacher effectiveness at secondary school level. There was no significant relationship between adequacy of teacher training and students' achievements, suggesting that the higher the level of training the lower the students' achievements.

5.2.3 Relationship between Teachers' Experience and Students' Academic Achievement

The third objective of the study sought to find out whether there was a relationship between teachers' experience and students' academic achievement. The teachers experience was expressed by the numbers of years they have taught at the secondary school level. Teachers had various years of professional teaching experience. Teachers who have been in the teaching profession for more than five years were about 49.4% of the respondents. This was followed by teachers who have been teaching for between 6-10 years. Teachers with 6-10 years of teaching experience constituted about 52(22.3%) of the respondents. Teachers who had been teaching for over 10 years had accounted for slightly more than 91(39%) of the study sample. Within this category those with 16-20 years of teaching were the majority, where they formed 39(16.7%) of the respondents, with those with 11-15 years were 31 (13.3%) and over 20 years accounting for 21(9%) of the respondents. The results showed that majority (61.6%) of the teachers had teaching experience of 6 years and above.

Only 38.6% had teaching experience of 5 years and below. It is evident that majority of the teachers had been in the teaching profession for less than five years.

The importance of experience teachers in schools has been highlighted by many researchers. Teacher experience improves teaching skills while pupils learn better at the hands of teachers who have taught them continuously over a period of years. Teachers' experience is very important because it has played a crucial role in educational attainment since teacher is ultimately responsible for translating policy into action. Many students perform poor in examinations as a result of in-experience in teaching methodology and content.

The Pearson's correlations results showed that the relationship between the teachers experience and students' academic achievement was positive and significant ($r= 0.272$, $p < 0.05$). This means that students taught by teachers with many years of teaching experience tend to perform better in their academic work. There is a positive effects of teaching experience in relation to students' achievement are not constantly additive, but instead tend to level off after a few years. A significant and positive relationship existed between teachers' number of years of experience and student achievement. The experienced teachers perform better because they have mastered the content and acquired classroom management skills to deal with different types of classroom problems.

Experience and tenure are considered as essential human capital factors and affects one's productivity. The same should apply to the teaching profession. An experienced teacher should be more familiar with the subject and have better control of students' learning than one new in the profession. Teachers with more work experience have higher self-efficacy and this partly explains why the students they teach perform better. Self-efficacy significantly influences teacher's commitment and work

performance. The teaching experience in schools significantly counts in the determination of students' achievement in external examinations.

5.2.4 Relationship between Teachers' Attitude towards Teaching and Students' Academic Achievement

The fourth objective was to establish whether there was a significant relationship between **t**eacher's attitude towards teaching and students' academic achievement. From the 22 statements used to explain teacher attitude had an overall mean score of 3.50 indicating that respondents agreed on its contribution towards academic achievement. This implies that the teacher attitude was averagely rated by the respondents. Attitude are formed as a result of some kind of learning experience. It may also be learned simply by following the example or opinion of teacher. Attitude possesses both cognitive and emotional components. The teacher attitude is important in students' academic achievement because they strongly influence social thought, the way an individual thinks about and process social information.

A teacher whose has a positive attitude towards teaching and towards his pupils will obviously teach more effective than teacher who has develop negative attitude towards the learners he has to deal with.ith.ith. Many teachers seldom realize that how they teach, behave interact with learners can be more paramount than what they teach. This is to say that some teachers do not realize the fact that their attitude could have effect on the learning achievement. The results of the Spearman's correlations showed that there was significant relationship between the teachers attitude and students' academic achievement ($r= 0.153$, $P<0.05$). Teachers attitude have a significant effect on students' academic achievement.

The results of the Spearman's correlations test indicated that teachers 'attitude towards teaching influences students' academic achievement. Teachers' characteristics are capable of influencing the learning achievement. A teacher who has a positive attitude towards teaching and his pupils will obviously teach more effective than teacher who has develop negative attitude towards the learners he has to deal with. Teachers as a molder of lives must be embodiment of good character and virtues, who is sincere in word and acts and whose personal life sets a good example to his pupils.

A negative teacher attitude therefore jeopardizes professional standards by influencing effectiveness of teaching methods and performance of students. Teacher attitude is majorly affected by the teachers' knowledge base and mastery of the subject knowledge and the socio-cultural context. Teacher attitude is also associated with quality teaching and learning in the classroom, teacher who poses a negative attitude impair the ability of students to be able to receive messages from the subjects that they teach leading to wrong interpretation of concepts. The role of the teacher as facilitator of learning and the contributors to learners' achievement is enormous but there are few of studies on teachers' attitude as determinants of intellectual development of students.

A teacher's attitude contributed significantly to students attention in classroom and their academic achievement. Teaching using methods that require students to listen, read and regurgitate depicts negative attitude to teaching. Teachers' attitude towards teaching is one of the major contributors towards explaining the variance in students' cognitive achievement. The teachers' attitude towards teaching affects their students' attitude to and achievement in the subject. No matter what amount of resources we

might put into the nation's education system, without properly prepared and motivated teachers, we can never expect from the system.

Teachers with high efficacy take responsibility for student learning and may view student failure as a push for greater effort to improve achievement. These teachers spend more time monitoring and working with their students (through whole-group instruction, for example), providing the means for higher levels of student engagement. Teachers who lacked a secure sense of teacher efficacy show weak commitment to teaching spend less time in subject matters in their areas of perceived inefficacy and devote less overall time to academic matters.

There was a positive relationship between the attitude ($r=.153$, $n=216$, $p<.05$), instructional leadership ($r=.165$, $n=216$, $p<.05$) and experience ($r=.272$, $n=216$, $p<.05$) on student academic achievement. There was no significant relationship between the highest education level of the teacher ($r=-0.027$, $n=216$, $p>05$) and student academic achievement. This indicated that an increase in teacher's attitude, instructional leadership and experience the student academic achievement in public secondary school improved. The more the teacher has the highest level of education does not significantly influence the student academic achievement in public secondary school.

Schools which perform well are led by principals and subject teachers who have the ability to set pace, lead and motivate staff and students to perform to their highest potential. The quality of education depends on the nature of leadership provided by the school principal, his/her ability to control, direct and guide teachers and students. An increased teacher participation in schools has the potential for significant positive effects on school improvement including students' academic achievement. An effective leadership facilitates the emergence of manageable and sustainable effort

when teachers and principals work with students to help them to achieve academic success.

There is little evidence that academic background, certification exam scores or personality characteristics can predict students' success. A teacher cannot be determined to be qualified by checking his or her education level, years of experience, or teaching certificate. Teachers influence student's academic achievement through their interactions with them, especially in the classroom. Thus, although important, teacher education level and experience only represent a portion of the ability to manage the classroom efficiently and to promote student achievement.

The effects associated with teacher's possession of an advanced degree are strikingly counterintuitive; especially given the salary incentives offered to encourage teachers pursue graduate degrees. The teacher's experience predicts children learning achievement. Significant relationship existed between teacher's experience and pupils' academic performance. The teacher quality depends on the knowledge and experience applied effectively to exhibit knowledge about teaching and learning.

From the Multiple Regression model, (R^2 = .148) showed that all the predictors account for 14.8% variation for the academic achievement in public secondary schools. The predictors used in the model have captured the variation in the academic achievement in public secondary schools. The measures of teacher inputs have varied widely, as have results from these investigations. Identification of teacher inputs and practices that contribute most towards improving students' achievement has often eluded researchers, even though most seem to believe that addressing poor teaching

may be the most effective means of improving school quality. Teacher quality is an important factor in academic achievement in public secondary schools, but it is not well captured by levels of teacher experience, certification, and education.

From the study findings the teacher attitude (β=.358, P<.05); instructional leadership (β=.304, P<.05); experience (β=.173, P>.05) and highest level of education (β=.035, P>.05) had varied influence on academic achievements in public secondary schools. The β value for attitude, instructional leadership, and experience had a positive coefficient thus positive relationship with the academic achievements in public secondary schools, while highest level of education was negative. The findings showed that attitude, instructional leadership and experience had significant relationship with academic achievements in public secondary schools. However the highest level of education had no significant negative relationship with academic achievements in public secondary schools.

5.3 Conclusions

The results of the study showed that the relationships between knowledge acquisition, conversion, application and work performance of teachers were strongly correlated and therefore led to the following conclusions;

i. A positive relationship exist between the teachers instructional leadership and students' academic achievement. The students taught by teachers with high instructional leadership abilities tend to perform better in their academic work. A strong association existed between instructional leadership and students' academic achievement and that an outstanding leadership was a key characteristic of schools that perform well in examinations. The instructional leadership is critical for curriculum implementation, evaluation and

supervision aspects that lead to higher students' academic performances. In order to improve learning and students' achievement, focus should be on the development of qualified and experienced teachers with strong instructional leadership abilities.

ii. Most of the teachers were holders of a university degree. All the teachers had the minimum qualification set by the Teachers Service Commission (TSC) for one to be a secondary school teacher. The teachers with the basic education level required for one to be employed as a secondary school teacher by the TSC have undergone further training. Although teachers qualification is a desired attribute from a quality assurance perspective.This study revealed that, these attributes have alesser influence on students academic performances. It can be argued that advancement by teachers academically must be reinforced with high pedagogical training for it to have the desired outcome of students excelling academically.

iii. Teacher experience improves teaching skills while pupils learn better at the hands of teachers who have taught them continuously over a period of years. Teachers' experience is very important because it has played a crucial role in educational attainment since teacher is ultimately responsible for translating policy into action. Many students perform poor in examinations as a result of in-experience in teaching methodology and content. An experienced teacher should be more familiar with the subject and have better control of students' learning than one new in the profession. Teachers with more work experience have higher self-efficacy and this partly explains why the students they teach

perform better. The years of practice (experiences) of teachers allows for a wider and focused instructional approach that results in higher students academic performance. It was important for experienced teacher to deliberately mentor the incoming teachers so as to improve their effectiveness in classroom instructions and by extension students academic performance.

iv. Teacher attitude is majorly affected by the teachers' knowledge base and mastery of the subject knowledge and the socio-cultural context. The teacher's attitude contributed significantly to student attention in classroom and on student academic achievement. Teaching using methods that require students to listen, read and regurgitate depicts negative attitude to teaching. Teachers' attitude towards teaching is one of the major contributors towards explaining the variance in students' cognitive achievement.

The teacher's attitude, instructional leadership and experience positively influenced the student academic achievement in public secondary school. The highest level of education does not significantly influence the student academic achievement in public secondary school. The R^2 = (.148) indicates that teacher factors considered account for 14.8% variation for the academic achievement in public secondary schools.

5.4 Recommendations

From the findings of the study, the researcher made the following recommendations;

i. The study showed that there is a positive and significant relationship between teachers instructional leadership and students academic performance. Instructional leadership can be improved by introducing instructional leadership training sessions in schools by the Board of Management (BOM)

Ministry of Education Science and Technology (MOEST) . The teachers can also be encouraged and provided with financial support to attend instructional leadership workshops, seminars and conferences. School administration should also create an environment conducive for the growth of instructional leadership. Teachers should be encouraged to continously acquire instructional leadership skills within and outside school systems through training, workshops and seminars to be organized by Board of Management (BOM), Principal, Teaccher Service Commission (TSC) and Ministry of Education Science and Technology (MOEST).

ii. This study revealed that, teachers qualification is a desired attribute from a quality assurance perspective and have a lesser influence on students academic performances. That advancement by teachers academically must be reinforced with high pedagogical training for it to have the desired outcome of students excelling academically. School administrators should include teacher factors such as instructional leadership, teacher qualification,experience and attitude towards teaching when developing policies and strategies for enhancing students academic achievement in their schools.

iii. The study provided empirical evidence that there is a significant relationship between teachers experience and students academic performance. School management should therefore, consider formulating policies and a work environment that is attractive to experienced teachers. Those mandated to manage schools should provide teachers with the opportunities to broaded their teaching experiences through benchmarking with collegues in the same subject area, worshops and seminars in the county and outside the county with high performing schools,

iv. The study showed a positive and significant relationship between the teachers attitude towards teaching and students academic performance. In this regard, school administrators and relevant government agencies should come up with policies, practices and environments where teachers can be assisted to developed positive attitude towards teaching such as caring, being kind and honest towards the learners. The study further recommends that teachers be supported and encouraged to develop positive attitude towards the teaching profession as a way of enhancing the academic achievement of the students they teach

5.5 Suggestions for Further Research

The study noted a number of areas that require further research. Among these are:

i. The study focused on the relationship between teacher factors and students achievement in Baringo county. There is need for a study that examines the relationship students achievement and other factors which influence it such as teaching methods, home environment, teachingand learning resources

ii. The second hypothesis test showed that the there is no significant relationship between teahers qualification and students academic achievement. A study to find out the causes of these phenomena needs to be done as students taught by teachers with higher qualifications are expectation to perform better.

iii. Head teachers are incharge of the schools they head and bear the ultimate responsibility for the academic performance of students in them. It would therefore be of interest to find out the effects of their leadership on students academic achievement.

iv. It would also be interesting to find out the relationship between other knowledge processes such as knowledge processing and evaluation on teachers work performance.

REFERENCES

Aaronson, D., Barrow, L., & Sander, W. (2007). Teachers and student achievement in the chicago achievement in secondary schools in Vihiga District, Kenya. *Current Research Journal*

Achoka, J. S. K., Odebero, S., Maiyo, J. K. & Mualuko, N. J. (2007). Access to Basic Education in Kenya: Inherent Concerns. *Educational Research and Review,* 2 (10): 275-284.

Ackers, J. & Hardman, F. (2001). Classroom interaction in Kenyan primary schools.

Adamson, G., O'Kane, D., & Shevlin, M., (2005). Students' ratings of teaching effectiveness: A laughing matter*? Psychological Reports, 96,* 225-226.

Adebanjo, K. K. (1999). *The relationship between performance in mathematics and physics at the school certificate level.* Unpublished B.Ed project, Obafemi Awolowo University, Ile-Ife, Nigeria

Adedeji, T. (2008). Teacher Variables As predictor of intellectual develop of primary school pupils' mathematics. International Electronic Journal of Elementary Education vol. issue 1. October 2008 *http://www.iejee.com/2008/tella.pdf Retrieved March 17,2015*

Adediwura, A. A. & Tayo, T. (2007). Perceptions of Teacher Knowledge, Attitude and Teaching Skills as Predictor of Academic Performance in Nigerian Secondary Schools. *Educational Research and Review,* 2(7): 165-17

Ademulegun, D. (2001). *Monitoring learning achievement of junior secondary school students in Lagos State. A prototype of state assessment.* Unpublished Ph.D Thesis. University of Ibadan.

Adesina, S. (1981). *Introduction to education planning*. Ile-Ife, University of Ife Press Ltd.

Adesoji, F.A. & Olatunbosun, S.M. (2008) Student, Teacher And School Environment Factors As Determinants Of Achievement In Senior Secondary School Chemistry In Oyo State, Nigeria *The Journal Of International Social Research Volume 1/2 pp 13-34*

Adeyanju; A. (2004). *School organization and classroom management*; Oyo, Anikab publishers.

Adeyegbe, S.O (2002). How people perform in examination Education and Manpower, Vanguard, December19,2015.

Adeyemi, T.O. (2008). *Teachers teaching experience and students learning outcomes in Secondary schools in Ondo state, Nigeria*. MED Project, Department of Educational Foundation and Management, University of Ado-Ekiti-Nigeria.

Adeyemo, D. A. (2005).“Parental Involvement Interest in Schooling and School Environment as predictors of Academic Self-efficacy among Fresh Secondary School Student in Oyo State, Nigeria.” *Electronic Journal of Research in Educational Psychology*, 5 - 3:163 180

Adeyemo, D. A. (2010). Educational transition and emotional intelligence, moving stories around the world, Edited by Divya Jindal-Snape *pp.33-47*.

Adodo, S.O. (2007). Effect of diagnostic remediation instructional strategies and students learning outcomes in junior secondary school integrated science. Unpublished Ph.D Thesis, University of Ado-Ekiti, Ekiti State.

Adu, E. O & Olatundun, S. O. (2007) “Teachers’ Perception of Teaching as Correlates of Students’ Academic Performance in Oyo State Nigeria” *Essays in Education*, 20: 57-63.

Aduda, D. (2005). *New Report Spells out the Future of Education.* The Daily Nation Monday. April, 2005 Nation Media Group Nairobi. http://www.kaeam.or.ke/ejournal/ articles/vo.

Afe J.O. (2001). Reflections on Becoming a Teacher and the Challenges of Teacher Education. *Inaugural Lecture Series 64*. Benin City: University of Benin, Nigeria.

Agwanda, J.A (2002). *A study of Student Achievement in Kenya Certificate of Education in Kisumu*. Unpublished M.Ed Thesis, Maseno University, Kisumu.

Aiken, L.R. (I970).‘Attitude towards mathematics’ Review of Educational Research, P558.

Akanbi, J.O. (2005). *How to study and pass important examinations*: A psychological Approach. Ibadan: Maritime Printers.

Akinleye G.A., (2001). “*Early childhood education: Guide for parents and teachers*” UNAD J. Educ., 2 (1) October; *.4and Research.* Nairobi: Government Printers.

Akinsolu, A.O. (2010).Teachers and Students’ Academic Performance in Nigerian Secondary Schools: Implications for Planning *Florida Journal of Educational Administration & Policy* Volume 3, Issue 2 pp86-103

Akiri, A. A. & Ugborugbo, N. M. (2008). An Examination of Genders Influence on Teachers productivity in Secondary Schools. *J. Soc. Sci*, 17(3): 185-191.

Alao, K. A. & Adeleke, A. (2000). A study of interference and factors influencing Phobia for mathematics among Nigeria secondary school students. *IFE Journal Of Psychology, 10*(1), 9-18.

Alexander, R. (2000). *Culture and pedagogy: International comparisons in primary education.* Oxford, UK: Basil Blackwell.

Ali, A. A.(2009) *The impact of teacher wages on the performance of students:* evidence from PISAmpra.ub.uni-muenchen.de/. Impact_of_teacher_wages on the.

Andersen, R. E. and Pellicer, J.K. (1998). A prospective longitudinal study of psychological predictors of achievement. *Journal of School Psychology,* 34(3), 285 - 306.

Anderson, J.B. (2000). Factors affecting learning of Mexican primary school children. *Estudios Economicos.* 15(1):117-152.

Andrew, M.D. (1990). Difference between graduates of 4-year and 5-year teacher preparation programs. *Journal of Teacher Education, 41,* 45-51.

Angrist, J.D. & Lavy, V. (2001). Does teacher training affect pupil learning? Evidence from matched comparisons in Jerusalem public schools. *Journal of Labor Economics.* 19(2):343-369.

Anita Kosgei, Jairo Kirwa Mise, Odhiambo Odera, Mary Evelyn Ayugi (2013). Influence of teacher characteristics on students' academic achievement among secondary schools. *Journal of Education and Practice*. Vol.4, No.3, 2013. www.iiste.org

Ankomah, Y., Koomson, J., Bosu, R., & Oduro, G. K. (2005). *Implementing Quality Education in Low Income Countries.* Institute for Educational Planning & Administration (IEPA) University of Cape Coast Ghana.

Araoyinbo, A. V. (1994). A causal model of some socio-psychological variables as determinant of learning achievement in secondary school social Studies. PhD thesis, Institute of Education. University of Ibadan.

Ariav, T. et al., (2006). *Committee for guidelines for teacher education. Report on programs in higher education institutions in Israel*. Council for Higher Education, Jerusalem. (Hebrew)

Arif, G.M. & Saqib, N. (2003). Production of cognitive and life skills in public, private, and NGO schools in Pakistan. *Pakistan Development Review.* 42(1):1-28.

Armstrong, D. G., Henson, K. T., & Savage, T. V. (2009). Teaching today: An introduction to education (8th ed.). Upper Saddle River, New Jersey, OH: Pearson.

Ary, D., Jacobs, L. C., & Razavieh, A. (2002). *Introduction to Research in Education* (6th ed.). Belmont: Wadsworth.

Ashton, P. (1996). "Improving the Preparation of Teachers" *Educational Researcher*, 25 No. 9: 21-22.

Ashton, P., & Crocker, L. (1987). Systematic study of planned variation: The essential focus of teacher education reform. *Journal of Teacher Education*, May-June, 2-8.

Babayomi, O.A. (1999) *Grade-related changes in the school Environment. Effects on Achievement Motivation.* In advances in motivation and Achievement, vol. 3: 155

Baker JA. (2006). Contributions of teacher-child relationships to positive school adjustment during elementary school. *Journal of School Psychology*.;44:211–229.

Bakhda, S. (2006). *Management and Evaluation of Schools*. Nairobi: Oxford University.

Ball, D., Thames, M.H. & Phelps, G. (2008). Content knowledge for teaching: What makes it special? *Journal of Teacher Education.* 59:389-408.

Ballard, C. L. and Johnson, M. (2004), "Basic Math Skills and Performance in Introductory Microeconomics," *Journal of Economic Education*, 35, 3-23.

Ballou, D., and Podgursky, M. (2000). Reforming teacher preparation and licensing: Continuing the debate. Teachers College Record. Retrieved June 15, 2000.

Balozi, C. & Njunge, J. (2004). *Trends in Teaching approaches and methods in Science and Mathematics Education* "SMASSE project.

Bandura, A. (1995). Exercise of personal and collective efficacy in changing societies. In A. Bandura (Ed.), *Self-efficacy in changing societies* (pp. 1–45). New York: Cambridge University Press.

Bandura, A., (1997). *Self Efficiency: The exercise of control.* New York: Freeman.

Barnes, M., & Rosenthal, R. (1985). Interpersonal effects of experimenter attractiveness, attire, and gender. *Journal of Personality and Social Psychology, 48*, 435–446.

Behrman, J.R., Kahn, S., Ross, D. & Sabot, R. (1997). School quality and cognitive achievement production: A case study for rural Pakistan. *Economics of Education Review.* 16(2):127-142.

Bell, F.H. (1978). Teaching and learning mathematics in secondary schools. Lowa; W.M.C. Brown Company Limited.

Bennis, W., & Thomas, R. J. (2002, September). Crucibles of leadership. *Harvard Business Review*, 80(9), 39–45.

Bentler, P. (1990). Comparative fit indexes in structural models. *Psychological bulletin, 107*(2), 238-246.

Benz, C. R., Bradley, L., Alderman, M. K., & Flowers, M. A. (1992). Personal teaching efficacy: Developmental relationships in education. *Journal of Educational Research, 85*(5), 274-285.

Berliner, D.C. (1987). Simple views of effective teaching and a simple theory of classroom instruction. In D.C. Berliner & B. Rosenshine (Eds.), *Talks to teachers* (pp. 93-110). New York: Random House.

Berliner, D.C. (2005).The near impossibility of testing for teacher quality. *Journal of Teacher Education, 56* (3), 205-213.

Berman, P., McLaughlin, M., Bass, G., Pauly, E. & Zellman, G., (1977). Federal programs

Betts, J.R., Zau, A.C., and Rice, L.A. (2003). *Determinants of Students achievements: New Evidence from San Diego.* San Diego: Public Policy Institute of California.

Blasé, J. & Blase, J. (2000). Effective Instructional Leadership. Teachers Perspective on Principals' Promote Teaching and Learning in Schools. *Journal of Education Administration.* 38 (2), 130-141.

Bogonko, S.N. (1994). *A History of Modern Education in Kenya* (1895-1991). Nairobi:

Boit, M., Njoki, A. & Chang'ach, J. K. (2012*). The Influence of Examinations on the Stated Curriculum Goals. American International Journal of Contemporary Research,* 2(2), 179 –182.

Borg, W.R. & Gall, M.D. (1989). *Educational research: an introduction,* 5th ed. New York: Longman.

Bowen, G. A. (2009). Document Analysis as a Qualitative Research Method [online]. Qualitative Research Journal, Vol. 9, No. 2, California.

Boyd, D., Grossman, P., Lankford, H., Loeb, S., & Wyckoff, J. (2010). *How changes in entry requirements alter the teacher workforce and affect student achievement*. *Journal of Education Finance and Policy, 1, 176-216*.

Boyd, Donald, Hamilton Lankford, Susanna Loeb, and James Wyckoff. (2005). "The Draw of Home: How Teachers' Preferences for Proximity Disadvantage Urban Schools." *Journal of Policy Analysis and Management* 24:113-132.

Braun, H.J. (2005). *Using student progress to evaluate teachers: A primer on value-added models.* ETS, Princeton. Available at: http://www.ets.org/ research/pic

Brown, C.A., Smith, M.S., & Stein, M.K. (1995). *Linking teacher support to enhanced classroom instruction*.Paper presented at the AERA Conference, New York.

Buddin,R., Zimmer, R., Chau, D.,Gill, B and Hamilton, L (2009). Teacher Effectiveness in Urban High Schools, *Journal of Urban* Economics, *66*(2), 103-115

Buhere, P., (2007). *A study of Quality of Education in Public Secondary Schools in Bungoma Division of Bungoma District*. Unpublished MED Project, University of Nairobi.

Burnett, P. C., & Meacham, D. (2002). Measuring the quality of teachers in elementary classrooms. *Asia-Pacific Journal of Teacher Education*, *3*(2), 141–154.

Burns, N. & Groove, S. K. (2003). *Understanding Nursing research* 3rd Ed. Philadelphia. Saunders Company

Buyse, E., Verschueren, K., Verachtert, P., & Van Damme, J. (2009). *Predicting school adjustment in early elementary school*: Impact of teacher-child relationship quality and relational classroom climate. *Elementary School Journal, 110*(2), 119-141.

Caprara, G. V., Barbaranelli, C., Borgogni, L., & Steca, P. (2003). Ef- ficacy beliefs as determinants of teachers' job satisfaction. *Journal of Educational Psychology, 95,* 821-832.

Carroll, T., & Foster, E. (2010). *Who will teach? Experience matters.* Washington, DC: National Commission on Teaching and America's Future. Retrieved from http://nctaf.org/wp-content/uploads/2012/01/NCTAF-Who-Will-Teach-Experience-Matters-2010-Report.pdf CDE, Baringo, 2013).

Chacon, C. (2005). Teachers' perceived efficacy among English as a foreign language teachers in Venezuela. *Teaching and Teacher Education*. 21, 257-272.

Chapman, J. D. (2003). "School Based Decision Making and Management: Implication for School Personnel." In J. D. Chapman (ed.). *School Based Decision Making and Management.*London: The Falmer Press.

Charles, H., (2002). "*MPs should work on better funding*" in Education Manpower by Wale Ajao in *Vanguard* Thursday, December, 19; 23.

Chepchieng, M.C. and J.K . Kiboss, (2004). *Influence of family socio-economic status and gender on students' academic performance:* A study of Baringo District Secondary Schools. J. Edu. Hum. Resour., 2(2):50-61.

Chetty, R., Friedman, J.N. & Rockoff, J.E. (2011). *Measuring the impact of teachers: Teacher value-added and student outcomes in adulthood.* (National Bureau of Economic Research (NBER) working paper no. 17699). Cambridge MA: NBER.

Chingos, M.M. & Peterson, P.E. (2011). It's easier to pick a good teacher than to train one: Familiar and new results on the correlates of teacher effectiveness. *Economics of Education Review.* 30:449-465.

Churchill, E.M.(1958). The Number Concept the Young Child: Researches and Studies. University of Leeds. Institute of Education.

Clifton, R. (2013): *Teachers Pay should be linked to Success of Students, not based on Seniority.* Retrieved- www.fraserinstitute.org/research-news/news-release

Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2007) *Teacher Credentials and Student Achievement in High School: A Cross-subject Analysis with Student Fixed Effects.* Working Paper 11 Washington, DC: Urban Institute, National Center for Analysis of Longitudinal Data in Education Research

Clotfelter,C.T., Ladd, H.F. and Vigdor, J. L. (2011). Teacher Mobility. School Segregation, and Pay-based Policies to level the playing field, *Education Finance and Policy, 6* (3), 399-438.

Cochran-Smith, M. (2001). The outcomes question in teacher education in teacher education. *Teaching and Teacher Education, 17*, 527-546.

Cockcroft, W. H. (1982). *Mathematics Counts: Report of the committee of Inquiry into the Teaching of Mathematics in Schools.* London: Her Majesty's Stationary Office, p.188.

Cohen, D.K., & Hill, H. (1977). *Instructional policy and classroom performance. The mathematics reform in California.* Paper presented at the AERA, Chicago, IL.

Cohen, Manion & Morrison (2008) *Research Methods in Education* (4th ed.). London: Routledge Publishers.

Conroy, M., Sutherland, K., Snyder, A., & Marsh, S. (2008). Classwide Interventions. *Teaching Exceptional Children, 40,* 24-30.

Collinbridge, D. (2008). The quality of Qualitative research. *American Journal of medical quality.* London: SAGE Publications, Inc

Creswell, J. W. (2008).*Educational research: Planning, conducting, and evaluating quantitative and qualitative research.* 3rd ed. Upper Saddle Creek, NJ: Pearson Education.

Creswell, J. W. (2009). *Research design: qualitative, quantitative, and mixed methods approaches.* 3rd ed. University of Nebraska-Lincoln: SAGE Publications, Inc

Creswell, J. W., (2003). *Research design: Qualitative, quantitative, and mixed methods approach* (2nd ed.). Thousand Oaks, CA: Sage.

Currall, S. C., Towler, A. J., Judge, T. A., & Kohn, L. (2005). Pay satisfaction and organizational outcomes. *Personnel Psychology, 58,* 613–640.

Dada, E.D. and Alani, P.J.(2001) Grade-related changes in the school Environment. Effects on Achievement Motivation. *In advances in motivation and Achievement,* vol. 3: 155

Danielson, C. (2010). Evaluations that help teachers learn. *Educational Leadership, 68*(4), 35-39. Retrieved from www.ascd.org

Darling-Hammond Commeyras M (2003) "*Promoting a culture of reading*" *The Comet* Thursday, February 13, 32.

Darling-Hammond, L. (1998) Teacher and Teaching; Testing Policy Hypothesis from a National Commission Report. In: *Educational Researcher*. Vol 27(1):5-15.

Darling-Hammond, L. (1999).Teacher quality and student achievement*: A review of state policy evidence.* Washington, University of Washington: Centre for the Study of Teaching and Policy.

Darling-Hammond, L. (2000). Reforming teacher preparation and licensing: Continuing the debate. *Teachers College Record, 102* (1), 5-27.

Darling-Hammond, L. (2001). The research and rhetoric on teacher certification: A response to "*Teacher certification reconsidered."*New York: National Commission on Teaching and America's Future.

Darling-Hammond, L. and Sykes, G. (2003). Wanted: A national teacher Supply policy for education: The right way to meet the "Highly Qualified Teacher" challenge. *Education Policy Analysis Archives,* 11(33), 1-50.

Darling-Hammond, L., & Bransford, J. (Eds.) (2005). *Preparing teachers for a changing world: What teachers should learn and be able to do.* San Francisco, CA: Jossey-Bass.

Darling-Hammond, L., (2002). *The research and rhetoric on teacher certification*: A response to "Teacher certification reconsidered." *Educational Policy Analysis Archives, 10* (36).

Darling-Hammond, L., Berry, B., & Thorenson, A. (2001) Does teacher certification matter? Evaluating the evidence. *Educational Evaluation and Policy Analysis*, *23*(1) 57–77.

Darling-Hammond, L., Chung, R., & Frelow, F. (2002) Variation in teacher preparation: How well do different pathways prepare teachers to teach? *Journal of Teacher Education*,*53*(4), 286–302.

Dessarollo, I. (2008). The Quality of Education in Latin America and Carribbean Latin America. Research Work Institute, Paraguay.

Dossett, D., & Munoz, M. A., (2003). *Classroom accountability: A value-added methodology*. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL. Engagements and school achievement. *Journal of Educational Psychology.*

Dovrat Committee, (2005). Israel – Task Force for the Advancement of Education in Israel. *National plan for education*. Jerusalem: Israel Government.

Eble, E.K.(1988). The Craft of Teaching. A Guide to Mastering the Profession Art (2nd ed.) San Francisco: The Jossey Bass Publishers.

Ehrenberg, R.G. & Brewer, D.J. (1995). Did teachers' verbal ability and race matter in the 1960s? Coleman revisited. *Economics of Education Review.* 14:1-21.

Ehrenberg, R.G., & Brewer, D.J. (1994). Do school and teacher characteristics matter? Evidence from high school and beyond. *Economics of Education Review*, *13,* 1-17.

Ejiogu, M. O. (1992). Age-of-acquisition, word frequency and neighborhood density effects on the development of spoken word recognition and phoneme awareness. *Journal of memory and lal1guage,* 45, 68 - 492.

Ekwueme,L. and Igwe, R. (2001). *Introduction to teaching profession*. Lagos. JAS Publications.

Elliott, B., & Crosswell, L. (2001), "*Teacher commitment and engagement', the dimensions of ideology and practice associated with teacher commitment and engagement within an Australian perspective.* Paper presented to the Australian Educational Research Association Conference, 2002, Brisbane, Available at: http://www.aare.edu.au/02pap/cro02522.htm.

Emmer, E.T. & Stough, L.M. (2001). Classroom management: A critical part of educational psychology with implications for teacher education. *Educational Psychologist, Vol. 36*, 103-112.

Enamul, H., Gazi, A and Kanesean, A. (2011). Impact of Teachers Professional Development on School Improvement – An Analysis at Bangladesh Standpoint, *Asia Pacific Education Review 12* (3), 337 – 348.

Eshiwani, G. S., (1993). *Factors Influencing Performance among Primary and Secondary Schools in Western Province of Kenya*. Unpublished paper, Department of Education Foundations, Kenyatta University.

Eshiwani, G.S. (1985*).* Sex Differences in the Learning of Mathematics. Education Report No.3, UoN.

Etsy, K. (2005). *Causes of Low Academic Performance of Primary School Pupils in Theshamia Sub-Metro of Shama Ahanta East Metropolitan Assembly of Ghana.* Regional Conference of Education in West Africa, Dakar Senegal, 1st -2nd Novemeber 2005

Everston, C.W., Hawley, W., & Zlotnik, M. (1985). Making a difference in educational quality through teacher education. *Journal of Teacher Education, 36* (3), 2-12.

Farr, S. (2011). Leadership, not magic. *Educational Leadership, 68*(4), 28-33. Retrieved from www.ascd.org

Farrant, J. S. (1980). *Principle and practice of education.* New edition: Burnt Mill. Longman Group Ltd

Fenech, M. (2006). The impact of regulatory environments on early childhood professional practice and job satisfaction: A review of conflicting discourses. *Australian Journal of Early Childhood*, 31 (2) 49-57.

Fenstermacher, G.D., & Richardson, V. (2005). On making determinations of quality in teaching. *Teachers College Record*, *107* (1), 186-213.

Ferguson, P., & Womack, S.T. (1993). The impact of subject matter and education coursework on teaching performance. *Journal of Teacher Education, 44* (1), 155- 163.

Ferguson, R. F. (1990). *Racial Patterns on How School and Teacher Quality Affect Achievement and Earnings.* Dallas: Meadows Foundation.

Ferguson, R. F. (1998). Can schools narrow the Black-White test score gap? In C. Jencks & M. Phillips (Eds). *The Black-White test score gap.* Washington, DC: Brookings Institution. 318-374.

Ferguson, R. F., & Ladd, H. F. (1996). How and why money matters: An analysis of Alabama schools. In H. F. Ladd (Ed.), *Holding schools accountable: Performance-based reform in education* (pp. 265–298). Washington, DC: Brooking Institution.

Ferguson, R. F., (1991). *Paying for public education*: New evidence on how and why money matters. *Harvard Journal of Legislation*, 28, 465-4 Foundation.

Ferguson, R. F., and Helen, F. L. (1996 How and Why Money Matters: An Analysis of Alabama Schools). "." In Ladd, Helen F. *Holding Schools Accountable: Performance-Based Reform in Education* (p. 265-298). Washington, D.C: The Brookings Institution.

Figilio, D. and Kenny, L. (2011). *Teacher Incentives and Student Performance.* National Bureau of Economic Research Working Paper, No. 12627.

Fraser, B. J., & Walberg, H. J. (2005). Research on teacher-student relationships and learning environments: Context, retrospect and prospect. *International Journal of Educational Research, 43*, 103-109. doi: 10.1016/j.ijer.2006.03.001

Fryer, R. G. (2011): *Teacher Incentives and Student Achievement: Evidence from New York City Public Schools*, Harvard University, NBER Working Paper No.15898.

Fullan, M. G. (1992). *Successful School Improvement: The Implementation Perspective and Beyond.* Buckingham. Open University press, 1992.

Gatanzamo, B.(1977). Mathematics, Society and Curriculum. London. Cambridge University Press.

Gay, L. R. (2003). *Educational research: Competencies for analysis and applications* (7th ed.).Upper Saddle River, NJ: Merrill Prentice Hall.

Gibbons S, Kimmel, H & O'Shea, M. (1997) *Changing Teacher Behaviour through Staff Development: Implementing the Teaching and Content Standards in Science School Science and Mathematics*; 976 (1):302-340.

Glewwe, P; Kremer, M. & Moulin, S. (2008). *Textbooks and Test Scores in Kenya*. University of Nairobi.

Glewwer, P., and Kremmer, P. (2006). *Schools, teachers and education outcomes in developing countries*, in E. Hanushek and F. Welch (Eds.), *Handbook of the Economics of Education* (pp. 945 – 1017). Amsterdam: Elsier.

Goddard, Y. L., Goddard, R. D., & Tschannen-Moran, M. (2007). A theoretical and empirical investigation of teacher collaboration for school improvement and student achievement in public elementary schools. *Teachers College Record, 109*(4), 877-896.

Goddard, Y. L., Neumerski, C., Goddard, R. D., Salloum, S., & Berebitsky, D. (2010). Is principal leadership related to teachers" instructional practice? A multilevel investigation of the relationship between principals" support of instructional improvement and differentiated instruction in schools. Manuscript under review in *Elementary School Journal*.

Goddard, Y., Miller, R., Larsen, R., Goddard, G., Jacob, R., Madsen, J., & Schroeder, P. (2010). Connecting Principal Leadership, Teacher Collaboration, and Student Achievement. Paper presented at the Annual Meeting of the *American Educational Research Association* in Denver, CO..

Goe, L. (2007). *The link between teacher quality and student outcomes: A research synthesis*. Washington, DC: National Comprehensive Center for Teacher Quality.

GOK (2005). *Sessional Paper No. 1 of 2005 on A policy Framework for Education, Training and Research.* Nairobi: Government Printers.

Goldhaber, D. and Emily, A. (2007). "Can Teacher Quality Be Effectively Assessed? National Board Certification as a Signal of Effective Teaching." The Review of Economics and Statistics, 89(1): 134-150.

Goldhaber, D. D., & Brewer, D. J. (2000) "Does Teacher Certification Matter? High school Teacher Certification Status and Student Achievement" *Educational Evaluation and Policy Analysis*, 22 (2):129-145.

Goldhaber, D. D. and Brewer, D. J. (2001). Evaluating the evidence on teacher certification: A rejoinder. Educational Evaluation and Policy Analysis, *23*,79- 86.

Goldhaber, D. E., (2004). *Indicators of teacher quality*. ERIC Clearinghouse on Urban Education New York NY.

Goldhaber, D. E., (2004). *Indicators of teacher quality*. ERIC Clearinghouse on Urban Education New York NY.

Good, T. L., & Brophy, J. (2003). *Looking in the classroom.* Boston: Allyn & Bacon.

Gravestock, P. & Gregor-Greenleaf, E. (2008) *Student Course Evaluations: Research, Models and Trends.* Toronto: Higher Education Quality Council of Ontario.

Greenwald, R. L., Hedges, V., & Laine, R. D., (1996). *The effect of school resources on student achievement.* Review of Educational Research, 66, 361-396.

Griffith, R. (1988). *Mathematics through Play: Easy Paths to Early Learning with your Child*. London. Cambridge University Press.

Guskey, T. R., & Passaro, P. D., (1994). Teacher efficacy: A study of construct dimensions. *American Educational Research Journal, 31*(3), 627-643.

Guyton, E., & Farokhi, F. (1987). Relationships among academic performance, basic skills subject matter knowledge and teaching skills of teaching education graduates. *Journal of Teacher Education, 38*, 37-42

Hallinger P., L. Bickman, L., & Davis, K. (1996). School context, principal leadership, and student reading achievement. *Elementary School Journal, 96*, 527-549.

Hallinger, P. (2003). Leading educational change: Reflections on the practice of instructional and transformational leadership. *Cambridge Journal of Education, 33*(3), 329-351.

Hallinger, P. (2005). Instructional leadership and the school principal: A passing fancy that refuses to fade away. *Leadership and Policy in Schools, 4*(3), 221-239.

Hanushek, E., Kain, J. and Rivkin, S. (1999). "Do higher salaries buy better teachers?" *NBER Working Paper* 7082

Hanushek, E. (2009). "Teacher deselection" in D. Goldhaber and J. Hannaway (Eds). 2009. *Creating a new teaching profession*. Washington DC: The Urban Institute Press. Hanushek, E. 2011. Valuing teachers. *Education Next.* 11(3):40-45.

Hanushek, E. (2011). Valuing teachers. *Education Next.* 11(3):40-45.

Hanushek, E. A., (1989). The impact of differential expenditures on school performance. *Educational Researcher, 18*(4), 45-65.

Hanushek, E. A., J. F. Kain and S. G. Rivkin (2005). Teachers, schools, and academic achievement", *Econometrical* 73(2), 417–458.

Hanushek, E., Kain, J., Markman, J. and Rivkin, S. (2001). Does peer ability affect student achievement? *Working paper* 8502, NBER

Hanushek, E., Kain, J., O'Brien, D. and Rivkin, S. (2005). "The market for teacher quality", NBER *Working Paper* 11154

Hanushek, E.A. (1971) Teacher characteristics and gains in student achievement*:* estimation using micro data, *American Economic Review* 61 (1971) 280–288.

Hanushek, E.A. (1986). The economics of schooling: production and efficiency in public schools. *Journal of Economic Literature*, 24 (1986) 1141–1177.

Hanushek, E.A. (1986). The economics of schooling: production and efficiency in public schools. *Journal of Economic Literature*, 24 (1986) 1141–1177.

Hanushek, E.A. (1997). "Assessing the Effects of School Resources on Student Performance: An Update." *Educational Evaluation and Policy Analysis*, 19(2): 141-164.

Hanushek, E.A. (2003). "The Failure of Input-Based Schooling Policies", *Economic Journal*, 113(February): F64-F98.

Hanushek, E.A. (1992). The trade-off between child quantity and quality. *Journal of Political Economy.* 100:85-117.

Hanushek, E.A., Rivkin, S.G., Taylor, L.L. (1996). "Aggregation and the estimated effects of school resources". Review of Economics and Statistics 78 (4), 611–627.

Hardman, B. K. (2011). Teacher's Perception of their Principal's Leadership Style and the Effects on Student Achievement in Improving and non-improving schools (Doctoral dissertation, University of South Florida).

Hardman, F. Abdi-Kadir, J. ; Agg, C. ; Migwi, J. ; Ndambuki, J. & Smith, F. (2009). *Changing Pedagogical Practice in Kenyan Primary Schools: the impact of school based training. In: Comparative Education, Vol.45 p 65-86*

Hardy, I. & Smith, E. (2006) 'Contesting Tertiary Teaching Qualification: An Australian Perspective' *Teaching in Higher Education,* Vol 11(2):337-350.

Harris, A. (2002). Effective leadership in schools facing challenging contexts. *School Leadership & Management*, *22*(1), 15-26.

Harris, A., & Chapman, C. (2002). *Effective leadership in schools facing challenging circumstances*. Retrieved from http:/www.nscl.org.uk

Harris, D. and Sass, T. R. (2008): *Teacher Training, Teacher Quality and Student Achievement.* Working Paper, No. 3, 2008, NCALDER, Florida.

Harris, Douglas N. and Tim R. Sass. (2007). "*What Makes for a Good Teacher and Who CanTell?*" Unpublished. Tallahassee: Florida State University.

Harris, O. & Sass, T.R. (2006). *Value-added models and the measurement of teacher quality.* Unpublished manuscript.

Heck, R., & Hallinger, P. (2009). Assessing the contribution of principal and teacher leadership to school improvement. *American Educational Research Journal*, 46, 659–689.

Hill, H.C., Rowan, B., and Ball, D.L. (2005). Effects of teachers' Mathematical Knowledge for teaching on student achievement. *American Educational Research Journal*, 42(2), 371-406.

Hill, H.C., Loewenberg Ball, D. & Schilling, S.G. (2008). Unpacking pedagogical content knowledge: Conceptualising and measuring teachers' topic-specific knowledge of students. *Journal for Research in Mathematics Education.* 39(4):372-400.

Hill, H.C., Rowan, B., and Ball, D.L. (2005). Effects of teachers' Mathematical Knowledge for teaching on student achievement. *American Educational Research Journal*, 42(2), 371-406.

Hill, P., (2010). *Asia-Pacific Secondary Education System Review Series No 1:Examination Systems.* B Thailand:

Hoxby, C., and Sonali, M. (2010*).* "Charter Schools In New York City: Who Enrolls and How They Affect Their Students' Achievement." *NBER Working Paper* 14852.

Hoy, W.K., and Woofolk E.A. (1993)."Teachers' Sense of Efficacy and the Organizational Health of Schools." The *Elementary School Journal*, 93(4): 356-372.

Huang, F.L. & Moon, T.R. (2009) Is experience the best teacher? A multilevel analysis of teacher characteristics and student achievement in low performing schools *Educ Asse Eval Acc* 21:209–234

Huber, S.G. (2004). School leadership and leadership development: Adjusting leadership theories and development programs to values and the core purpose of school. *Journal of Educational Administration*, 42, 669–684.

Ibarahim, A. (2000). *Evaluating the pedagogical competence of junior secondary school Integrated Science.* Teachers' 40th STAN Annual Conference Proceedings. 138-142.

Ibukun, W.O. (2009). *Building the future: Invest in teachers now.* A paper presented at the ondo state world teachers day Monday, 5th October.

Ijaiya N.Y., (2000). "*Failing schools' and national development*: Time for reappraisal of school effectiveness in Nigeria" Niger. J. Educ. Res. Eval. (2): 2; 42

Ilugbusi, A.A.; Falola, E.O. and Daramola, M.A. (2007). Relative effects of demographic variables on levels of anxiety of integrated science trainee teachers in junior secondary school in Ekiti State. *Journal of Educational Focus*, 1(1), 88-95

Indimuli, J., Mushira, N., Kuria, P., Ndung'u, R., & Waichanguru, S. (2009), *Teaching primary mathematics*. Jomo Kenyatta Foundation, Enterprise Road, Nairobi.

Ingersoll, R.H. (2003). O*ut of field teaching and the limits of teachers' policy*. A research report.Washington: Center for the Study of Teaching and Police, University of Washington.

Irumbi, G.S. (1990). '*A Study of Teachers and Pupils Characteristics that Affect the Performance of Std 8 Pupils in Mathematics at the end of Term 2 Examination in Githunguri Education Zone, Kiambu District, Kenya*.'An unpublished M.Ed. Project. KU.

Jackson, C. K. (2010), Match quality, worker productivity, and worker mobility: Direct evidence from teachers, NBER Working Paper 15990, *National Bureau of Economic Research*.

Jackson, W., (2003). *Methods: Doing Social Research.* Toronto: Pearson Education, Inc.

Jacob, B. A., Thomas J. K., Rockoff, J.E, & Staiger D.O. (2011). "Can You Recognize an Effective Teacher When You Recruit One?" *Education Finance and Policy*, 6(1): 43-74.

Jacob, B.A. (2007). "Teacher." *The Future of Children & the Challenges of Staffing Urban Schools Effectively*, 17(1): 129-153.

Jacob, B.A., & Lefgren, L. (2004). The impact of teacher training on student achievement: Quasi-experimental evidence from school reform efforts in Chicago. *Journal of Human Resources, 39* (1), 50-79.

James, K. T., Mann, J., & Creasy, J. (2007). Leaders as lead learners: A case example of facilitating collaborative leadership learning for school leaders. *Management Learning, 38*(1), 79-94. doi:10.1177/1350506707073026

Johnson, D.A. and Rising, G.A. (1972). *Guidelines for Teaching Mathematics. California.* Woods worth Publishing Company inc.

Johnson, D.A. (1967). Attitude in the Mathematics Classroom. *School Science & Mathematics,* pg.113.

Kane, T. J, Rockoff, J.E, & Staiger, D.O. (2006). What does certification tell us about teacher? Effectiveness? Evidence from New York City (NBER working Paper No.W12155). Cambridge, MA: *National Bureau of Economic Research.*

Kane, T.J., and Staiger, D.O. (2008). "Estimating Teacher Impacts on Student A Study of Factors Influencing Achievement in Mathematics Achievement*:* An Experimental Validation." *NBER Working Paper* 14607.

Kane, T.J., Rockoff, J.E. and Staiger, D.O. (2006). "What Does Certification Tell Us About Teacher Effectiveness? Evidence from New York City." *NBER Working Paper* 12155.

Karpati, A. (2009). *Teacher Training and Professional Development*. Retrieved – http://econ.core.hu/file/download/greenbook/chapter8pat.

Kasomo D., 2006, *Research methods in Education and Hu-manities*, Njoro: Egerton University Press.

Kathuri, N.S. (1986). Factors that Influence Pupils in KCPE. KU. *Bureau of Educational Research.*

Kharshud, K. (2010). A study of the Relationship between Professional Qualification of Teachers and Academic Performance of their Students at Secondary School Level in Pakistan, *International Journal of Human and Social Science*, *3* (6), 41 – 52.

Khurshid, F., Qasmi, F. N., & Ashraf, N. (2012). The relationship between teachers' self-efficacy and their perceived job performance. *International Journal of Contemporary Research in Business, 3*(10), 86-99.

Kibe, Odhiambo & Ogwel (2008). *Impact of SMASSE INSET on students' capacity through improved teaching and learning in the classrooms*, a paper presented at the 8th Regional conference for SMASSE WECSA, Nairobi.

Kiesling, H.J. (1984). Assignment practices and the relationship of instructional time to the reading performance of elementary school children. *Economics of Education Review, 3,* 341-350.

Kimani, G. (1991). '*A study of factors influencing achievements in mathematics among Primary School In-Service Students Teachers in Kenya*.' Unpublished M.ED Thesis. KU.

Kimani, G., Kara, A. and Njagi, L (2013).Teacher Factors Influencing Students' Academic Achievement in Secondary Schools in Nyandarua County, *International Journal of Education and Research, 1* (3), 6 – 34.

Kingdon, G. T. (2006). *Teacher Certification Higher Pay and Academic Performance India.* A Working Paper NO. 59. Global Poverty Research Group. Retrieved – http://economicsouls.ok.ac.uk/14026/1/gprog.wps-059pelf.

Kinyanjui, M.G. (2004). *Teacher Related Factors that Influence Students Academic Performance in Mathematics in Public Secondary Schools in Kikuyu Division.* Unpublished M.ED Project Report. UoN.

Kirembu, K.J., (1991). A *Study Selected Factor Related to Performance in Mathematics among Form Three Students in Kirinyaga District.* Unpublished M.ED Thesis. KU.

Kisirkoi, F. K. (2012). Effectiveness of teacher advisory centres (TACs) in teacher professional development in Nairobi County. *International Journal of Current research*, 4(4), 297 – 302.

Kitgaard, R.H., & Hall, G.R. (1974). Are there unusually effective schools? *Journal of Human Resources, 10* (3), 40-106.

Koech, P.L. (2006). *Influence of Gender Stereotype on Girls and Performance in Mathematics in Secondary Schools in Butere – Mumias Districts.* Unpublished M. Phil. Thesis, Moi University, Eldoret, Kenya.

Kombo D K and Tromp D L A (2006), *Project Writing Thesis project*: An Introduction Paulines Publications

Kothari C R. (2009), *Research Methodology, Methods and Techniques 2nd Edition*. NewDheli India.

Krueger, A. (2003), *"Economic Considerations and Class Size"*, Economic Journal, 113, February, F34-F63

Laczko-Kerr, I., & Berliner, D. C. (2002). "The Effectiveness of "Teach for America" and other Under-certified Teachers on Student Academic Achievement: A Case of Harmful Public Policy." *Education Policy Analysis Archives*, 10(2):1-52.

Lai, E.R. (2011) Collaboration www.pearsonassessments.com/hai/images/.../ Collaboration-Review.pd...

Lambert, L. (2002). A framework for shared leadership. *Educational Leadership, 59*(8), 37-40.

Leithwood, K. (1994). Leadership for school restructuring. *Educational Administration Quarterly, 30*(4), 498-519.

Leithwood, K., & Beatty, B. (2007). *Leading with teacher emotions in mind*. Thousand Oaks, CA: Corwin.

Leithwood, K., Harris, A., & Hopkins, D. (2008). Seven strong claims about successful school leadership. *School Leadership & Management,* 28, 27–42.

Leithwood, K., Jantzi, D., & Steinbach, R. (2002). School leadership and the New Right. In K. Leithwood, P. Hallinger, G. Furman, P. Gronn, J. MacBeth, B.

Mulford, & K. Riley (Eds.), *Second international handbook of educational leadership and administration* (pp. 849-880). Norwell, MA: Kluwer.

Leithwood, K., Seashore Louis, K., Anderson, S., & Wahlstrom, K. (2004). *How leadership influences student learning.* New York: Wallace Foundation.

Lewin, K. M., Wasanga, P., Wanderi, E. & Somerset, A. (2011). Participation and Performance in Education in Sub-Saharan Africa with Special Reference to Kenya: Improving Policy and Practice. Create pathways to Access. *Research Monograph No. 74:* University of Sussex.

Lezotte, L. (2001). *Revolutionary and evolutionary: the effective schools movement*. Indianapolis, IN: Solution Tree.

Lindsay, M. (2001).The philosophical underpinnings of educational research. *Polyglossia Vol. 19 p. 53 -59*

Lockheed, Marlaine E. & Komenan, Andre. (1989). "*Teaching Quality and Student Achievement in Africa:* The case of Nigeria and Swaziland" Teaching and Teacher Education Vol. 5, No.2, pp. 93-11.

Loeb, H., Elfers, A. M., & Plecki, M. L. (2010). Possibilities and potential for improving instructional leadership: Examining the views of national board teachers. *Theory into Practice, 49*(3), 223-232.

Loeb, S., & Beteille, T., (2008). *Teacher labor markets and teacher labor market research*. In G. Duncan & J. Spillane (Eds.), Teacher quality: Broadening and deepening the debate (pp. 27-58). Evanston, IL: Northwestern University.

Louis, K. S., Dretzke, B., & Wahlstrom, K. (2009). *How does leadership affect student achievement? Results from a national survey.* Paper presented at the Annual Meeting of the American Educational Research Association, San Diego.

Luschei, T.F., & Carnoy, M. (2010). Educational production and the distribution of teachers in Uruguay. *International Journal of Educational Development.* 30(2):169-181.

Lydiah, L. M. & Nasongo, J. W. (2009). Role of the headteacher in academic achievement in secondary schools in Vihiga District, Kenya. *Current Research Journal of Social Sciences 1*(3), 84-92, Available online athttp://maxwellsci.com/print/crjss/(3)84-92.pdf

Maagan, D. (2007). Teaching staff survey (2007) in elementary schools 2005/6) . Jerusalem: *Israel Central Bureau of Statistics*. (Hebrew)

Majasan, J.A. (1995). The Teachers Profession. *A Manual for Professional Excellence*. Spectrum Books Ltd.

Margret, N.N. (2003). *Factors Influencing the Performance of Mathematics among Public Secondary School Students in Nairobi Province*. M.ED. Project. UoN.

Marino, J. J. (2007). A new paradigm for organizational change: Involving customers and stakeholders in the improvement process. *Journal for Quality & Participation, 30*(1), 10-12. Retrieved from http://www.ascd.org

Marks, H. M. & Printy, S. M. (2003). Principal leadership and school performance: An integration of transformational and instructional leadership. *Educational Administration Quarterly, 39*(3), 370-397.

Marshall, J.H. & Sorto, A. (2012). The effects of teacher mathematics knowledge and pedagogy on student achievement in rural Guatemala. *International Review of Education.* 58:173-197.

Marshall, J.H., Chinna, U., Nessay, P., Hok, U.N., Savoeun, V., Tinon, S., & Veasna, M. (2009). Student achievement and education policy in a period of rapid expansion: Assessment data evidence from Cambodia. *International Review of Education.* 55(4):393-413.

Matthews, B. and Ross, L. (2010). *Research Methods*: A practical Guide for the Social Sciences. Edinburgh Gate: Pearson Education Ltd.

Matthews, P., & Sammons, P. (2005). Survival of the weakest: The differential improvement of schools causing concern in England. *London Review of Education*, 3, 159–176.

Maundu, J. N. (1986). *Student Achievement in Science and Mathematics: A Case of Extra Provincial, Provincial, and Harambee Secondary Schools in Kenya*. PhD Thesis. McGill University, Montrea

McCaffrey, D.F., Lockwood, J.R., Koreetz, D., Louis, T.A., & Hamilton, L. (2004). Models for value-added modeling of teacher effects. *Journal of Educational and Behavioral Statistics, 29* (1), 67-101.

Miller, E. (2006). *Education reform in the Commonwealth Caribbean* (No. 54 Educational Series). Kingston, Jamaica: Organization of American States.

Ministry of Education (MoE) (2010). *EMIS Education Statistics.* MoE: Windhoek, Namibia.

Ministry of Education (2010). *Policy brief on Education No.18 August.* Nairobi: Ministry of Education

Ministry of Education (MoE) (2011). *Collective delivery of the Education promises: improving the education and training systems for quality learning outcomes and quality of life.* Presented at the National Education conference, 27 June-1 July 2011, Windhoek, Namibia.

Ministry of Education Science and Technology (2005) Sessional Paper NO.1 of 2005 on *A Policy Framework for Education and Training and Research*.

Miskel, C., D. McDonald, and S. Bloom. (1983). Structural and expectancy linkages within schools and organizational effectiveness. *Journal of Leadership for Effective and Equitable Organizations* 19, no. 1: 49–82.

MoEST (2002*)*: *Draft on Education Sector Strategic Plan, 2003-2007.* Nairobi: Government Printer.

Monk, D. H. (1994) "Subject Area Preparation of Secondary Mathematics and Science: Teachers and Student Achievement." *Economic of Education Review*, 13(1):125-145.

Monk, D.H., and King, J (1994). Multi-level teacher resource effects on pupil performance in secondary Mathematics and Science: *The Role of teacher subject-matter preparation in contemporary policy issues: choices and*

consequences in Education, edited by Ronald Ehrenberg. Ithaca, NY: ILR Press

Mugenda, O and Mugenda, A. (2008). *Research Methods Quantitative and Qualitative approaches.* Nairobi Acts Press.

Mugenda, O. M. A. & Mugenda, A.G. (1999). *Research Methods: Quantitative and Qualitative Approaches.* Nairobi: African Center for Technology Studies (ACTS) Press.

Mulford, B. (2003). *School leaders: Changing roles and impact on teacher and school effectiveness.* Paper commissioned by the Education and Training Policy Division, OECD, for the Activity Attracting, Developing and Retaining Effective Teachers, Faculty of Education, University of Tasmania.

Munguti, B.K. (1987*).* A Survey of Factors Affecting the Teaching & Learning of Mathematics in Primary Schools in Mbooni. M. ed. Project. UoN.

Muriladharan, H and Sundararaman. S (2011).Teacher Performance Pay: Experimental Evidence from India. *Journal of Political Economy*, *3*(5), 23-47.

Murnane, R. J. (1996). *The Impact of School Resources on the Learning of Inner-city children.* Cambridge, MA: Ballinger.

Murnane, R.J. and Phillips, B.R. (1981). "What Do Effective Teachers Of Inner-City Children Have In Common?" *Social Science Research* 10, no. 1: 83-100.

Mwamenda, T. S. & B.B. Mwamwenda (1989). "*Teacher Characteristics and Pupils' Academic Achievement*" [Botswana], International Journal of Educational Development, vol.9, No.1, pp. 31-42.

Mwangi, D.T. (1986*).* 'Factors Influencing Performance & Learning of Mathematics among Secondary School Students in Kenya. *Bureau of Education Research.* K .U.

National Council of Teachers of Mathematics (NCTM). (2000). *Principles and standards for school mathematics.* Reston: NCTM.

National Economic Empowerment and Development Strategies (NEEDS, (2005*). National planning commission,* Central Bank of Nigeria, Abuja, 3, 34-38.

Ndebbio, J. E. (2000). *Planning and Execution of Development Program:* Seminar Paper on Developing Strategies and Labor Research Services 12th – 15th December 2002. University of Lagos, Lagos

Ndu, S.A. (2002). Middle-grade predictors of students' motivation and behaviour in high school. *Journal of Adolescent Research,* 15,327 - 352.

Njuguna, B. (2005). *A report of Educational standard of Nyanza province.* "Students can excel in mathematics.All is lost in the guest for better performance in mathematics", P. 29-30.

Nsubuga, Y.K.K.(2003). *Development and Examination of Secondary School in Uganda* Odhiambo, G. (2005). Elusive search for Quality Education. The Case of Quality Assurance and *of Social Sciences 1*(3), 84-92, Available online at http://maxwellsci.com/print/crjss/(3)84-92.pdf

Obadara, N.O. (2005); A prospective longitudinal study of psychological predictors of achievement. *Journal of School Psychology,* 34(3), 285 - 306.

Oderinde, B.B (2003). Examination and pupils Performance Education & Manpower,Vanguard, Thursday, January16,2003.

Odhiambo, G. (2005). Elusive search for Quality Education. The Case of Quality Assurance and *of Social Sciences 1*(3), 84-92, Available online at http://maxwellsci.com/print/crjss/(3)84-92.pdf

Odunusi, M.A. (1999). Essential elements of strong parent Involvement programs. *Educational Leadership*, 47, 18-20.

OECD (2005). *Attracting, Developing and Retaining Effective Teachers - Final Report: Teachers Matter*. OECD Publishing.

Ogundare S.F., (2001). "*Purposes and problems of recess in Nigerian primary schools*" UNAD J. Educ. 2 (1) October 2001; 4 – 8.

Ogunsola, T.A. (1991). The Impact of family background factors on Academics.

Ogunwuyi, O. (2000). A *causal model of teacher and student factors as determinants of achievement in secondary school integrated science.* Unpublished Ph.D Thesis. University of Ibadan, Ibadan.

Ohba A. (*2009*). *Does free secondary education enable the poor to gain access? A study from rural Kenya. (Create Pathways to Access, Research Monograph No. 21). Retrieved from* http://r4d.dfid.gov.uk/PDF/Outputs/ ImpAccess_RPC/PTA21.pdf

Okorji P.N, and Ogbo R.N, (2013). Effect of Modified clinical supervision on Teachers instructional performance. *Journal of Emerging Trends in Educational Research and Policy Studies* (JETRAPS).

Olatunji, A. and Nuvadeen, B. (2010).Teachers Attributes as Correlates of Students' Academic Performance in Geography in Secondary Schools in One State in Nigeria. *Pakistan Journal of Social Sciences, 7* (5), 388 – 392.

Oloyede, A. (1992). A comparative analysis of the school certificate performance in biology of professionally trained and non-professionally trained teachers in Lagos State. Lagos *Journal of Science Education* ,1 (1), 70-75.

Omosewo, E. O. (1998). A proposal for an improved training programme for prospective physics teachers in Nigeria secondary schools. *Science education form, 2, 36 - 41*

Onocha, C.O. (1985). *Pattern of relationships between home and school factors and pupils' learning outcomes in Bendel Primary Science Project.* Unpublished Ph.D Thesis, University of Ibadan, Ibadan.

Onsomu, E., Muthaka, D., Ngware, M. & Kosimbei, G. (2006). Financing of Secondary Education in Kenya: Costs and Options. *KIPPRA Discussion Paper No. 55.* Nairobi: Kenya Institute for Public Policy Research and Analysis.

Oredein, A. O. & Oloyede, D. O. (2007). Supervision and Quality of Teaching Personnel Effects on Student Academic performance. *Educational Research and Review,* 2 (3): 032-035.

Orodho, A.J. (2008). *Essentials of Educational and Social Science Research Methods*. Nairobi: Mosala Publishers.

Owoeye, J. S. & Yara, P. O. (2011) School Location and Academic Achievement of Secondary School in Ekiti State, Nigeria *Asian Social Science* Vol. 7, No. 5;pp 170-175

Patrick, B. (2005). Why children must not be Compared *In Education Sight for Quality Information Magazine,* Kenya

Pecheone, R., Rogers, J., & Moirs, K. (2001). *A beginning teacher survey study: A policy practice perspective. Paper presented at the annual meeting of the American Educational Research Association*. Seattle. WA.

Pounder, J. S. (2003). 'Employing transformational leadership to enhance the quality of management development instruction', *The Journal of Management Development*, 22, 6-13.

Prieto, L.R., & Altmaier, E.M., (1994). *The relationship of prior training and previous teaching experience to self-efficacy among graduate teaching assistants*. *Research in Higher Education, 35*(4), 481-497.

Raudenbush, S., Rowen, B., & Cheong, Y., (1993). *Contextual effects on the self-perceived efficacy of high school teachers. Sociology of Education, 65*, 150-167.

Raymond, M., Fletcher, S. H., & Luque, J. (2001). *Teach for America: An evaluation of teacher differences and student outcomes in Houston, Texas.* Stanford, CA: Center for Research on Education Outcomes.

Rice, J. K., (2003). *Teacher quality*: *Understanding the effectiveness of teacher.* Washington, DC: Economic Policy Institute. , University of Tennessee, Knoxville).

Richardson, A. R. (2008). *An Examination of Teacher Qualifications and Student Achievement in Mathematics* etd.auburn.edu/etd/bitstream/handle/ /Richardson Antoine_8.pdf

Riley, K., & McBeath, J. (2003). Effective leaders and effective schools. In N. Bennett, M. Rivkin, S. G., Hanushek, E. A., & Kain, J. F., (2005). *Teachers, schools, and academic achievement*.*Econometric73,417-458*.

Rivers, C. & Sanders, M. (2002) *Statewide Class-size Studies Prime Time and Star, Tennessee's Project Star*Dallas Texas

Rivkin, S. G., Hanushek, E.A., and Kain, J. F. (2005).Teachers, schools, and academic achievement. *Econometrica,* 73 (2), 417-458.

Rivkin, S. G., Hanushek, E. A, & Kain, J. F. (2005). *Teachers, schools, and academic achievement.*[Online]Available:http://www.utdallas.edu/research/tsp/ pulications.htm. (May 12, 2012).

Rivkin, S., Hanushek, E.& Kain, J. (2005). "Teachers, Schools and Academic Achievement", *Econometrica*, 73(2): 417-58.

Rivkin, S.G., Hanushek, E.A., & Kain, J.F. (2000). *Teachers, schools and academic achievement.* Working paper 6691 (revised). Massachusetts: National Bureau of Economic Research.

Rockoff, J.E., and Douglas, S. (2010). "Searching for Effective Teachers with Imperfect Information." *Journal of Economic Perspectives*, 24(3): 97-118.

Rockoff, J. E., (2004). The impact of individual teachers on student achievement: Evidence from panel data. *American Economic Review*, 94(2), 247-252.

Ross, J. A., Cousins, J. B., & Gadalla, T., (1996). *Within-teacher predictors of teacher efficacy. Teaching and Teacher Education, 12*(4), 385-400.

Ross, J., & Gray, P. (2006). School Leadership and student achievement: The mediating effects of teacher beliefs. *Canadian Journal of Education, 29*(3), 798-822.

Rotter, J. B., (1966). *Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 80*, 1-28.

Rowan, B. (2002). What large scale survey research tells us about teacher effects on student achievement: *Insights from the Prospects study of elementary schools*. Ann Arbor: University of Michigan.

Rowan, B. Chaing, F.S., & Miller, R.J. (1997) "Using research on employees' performance to study the effects of teachers on students' achievement" *Sociology of Education*, 70(1):256 285.

Ruthland, S. K. & Bremer, C. D (2002) 'Alternative Teacher Certification Procedures and Professional Development Opportunities for Career and Technical Education Teachers' Washington D.C.: *ERIC Clearinghouse on Teacher Education*

Ryan, K. & Cooper, J. (1984). *Those who can Teach.* (4th Ed). Boston: Houston Mifflin Co.

Ryan, R.M. and Edward L.Deci (2010). Intrinsic and Extrinsic Motivations. *Contemporary Educational Psychology,*vol.25,5467http://mmrg.pbworks.com/f/Ryan,+Deci+00.pdf.

Safer, A. M., Farmer, L. S. J., Segalla, A., & Elhoubi, A. F. (2005). *Does the distance from the teacher influence student evaluations? Educational Research Quarterly, 28* (3), 28-35.

Saha, Lawrence J., (1983). "*Social structure and Teacher Effects on Academic Achievement*:A comparative analysis", Vol. 27 No.1.

Sanders, W.L. (2000). Value-added assessment from student achievement data: Opportunities and hurdles. *Journal of Personnel Evaluation in Education, 14* (4), 329-339.

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

Sandt, S. (2007). Effects of maternal employment and non-maternal infant care on development at two and four years. *Early Development and Parenting*, 3(2), 113 - 123.

Santiago, P. (2002). *Teacher demand and supply: Improving teaching quality and addressing teacher shortage*. OECD Education Working Paper No. 1. OECD Head of Publication Service.

Saunders, M., Lewis, P. and Thornhill, A., (2007). *Research Methods for Business Students*, 4th Ed, Prentice Hall Financial Times, Harlow schools causing concern in England. *London Review of Education*, 3, 159–176.

Schwandt, T. (2007). *Qualitative inquiry in geosciences education research*. The Geological Society of America. University of Illinois: Sage

Shulman, L.S., (1986). *Those Who Understand*: Knowledge Growth in Teaching. In *Educational Researcher*, 15(2), (pp.4-14).

Sidhu, K.S. (1982). *The Teaching of Mathematics.*New Delhi. Sterling Publishers. SMASE (2009*).* Mathematics Manual. Nairobi.

Sifuna, D. N., & Sawamura, N. (2010). *Challenges of quality education in sub-Saharan African Countries*. New York: Nova Science Publishers.

Siringi, S., (2011). *Half the candidates won't join college*. *Daily Nation*, p. 5.

Skinner, E. A., Wellborn, J. G., & Connell, J. P., (1990). *Teacher efficacy " Its meaning and measure*. *Student Academic performance*. *Educational Research and Review,* 2 (3): 032- 035.

Slater, H., Davies, N. & Burgess, S. (2009). *Do teachers matter? Measuring the variation in teacher effectiveness in England*. (Centre for Market and Public Organisation (CMPO) Working Paper Series; number 09/212). Bristol: CMPO.

Slavin, D.H. (1995). Self-Efficacy, Education and Instruction. **In** J.E. Maddux (Ed) Self-efficacy, Adaptation, and Adjustment: Theory, research, and application (pp. 281 -303): New York: Plenum Press.

Spillane, J. P. (2005). Distributed leadership. *Education Forum, 69,* 143-150. Retrieved from http://distributedleadership.org

Spillane, J. P. (2006). *Distributed leadership*. San Francisco, CA: Jossey-Bass.

Stewart, V. (2011). Raising teacher quality around the world. *Educational Leadership, 68*(4), 16-20. Retrieved from http://www.ascd.org

Stiggins, R.J., Arter, A., Chappauis, J., and Chappauis, S. (2007), Classroom assessment for students learning: Pearson Education, Upper Saddle River, NJ.

Stringfield, S. & Teddlie, C. (1991) School, Classroom and students' Level Indicators of Rural School Effectiveness *A Journal of Research in Rural Education*, 7(1):15-28.

Stronge, J.H., Ward, T.J. & Tucker, P.D. & Hindman, J.L. (2007). What is the Relationship Between Teacher Quality and Student Achievement? An Exploratory Study *J Pers Eval Educ* (2007) 20:165–184

Stumbo, C., & McWalters, P. (2010). Measuring effectiveness: What will it take? *Educational Leadership, 68*(4), 10-15. Retrieved from http://www.ascd.org

Summers, A.A., & Wolfe, B.L. (1977). Do schools make a difference? *American Economic Review*. 67:639-652.

Sureiman, O (2010). Determinants of Academic Performance in Public Day Secondary Schools, Manga District, Kenya. *Journal of Technology and Education in Nigeria, 15*(1), 37-49.

Teachers Service Commission (2011). *Operational Manual on Teacher Management*.

Teddlie, C. and Tashakkori, A. (2003). Mixed Methodology: *Combining Qualitative and Quantitative Approaches*. Thousand Oaks: Sage Publications.

Thakur, D.N. & Thakur, D. (2004). *Educational Planning and Administration*. 2nd edition

Townsend, T. (2010). Educating school leaders to think and act both locally and globally. *International Journal of Leadership in Education, 13*(3), 335-348. doi:10.1080/ 1363124.

U.N.E.S.C.O. (1986) *A Handbook for Biology Teachers in Africa* Paris: United Nations Educational, Scientific and Cultural Organization, 1986.

UNESCO (2006). *World Data on Education.* VII Ed. Paris: UNESCO

UNESCO. (2004). Effects of Leaner; variable on Academic performance and Adjustment of Junior Students: Counselling Implication for UBE programme. *Counselling Association of Nigeria*. Conference August 2007.

Waihenya, K. (2000). '*Hated yet Prized Subject.'* In Daily Nation.P.19,22.

Walsh, K. (2001). *Teacher certification reconsidered: Stumbling for quality*. Baltimore,

Wando, D.H. (1992). '*A Study of the Relationship between Teachers' Attitude Towards Mathematics and Pupils', Performance of Mock Examinations among Std 8 Pupils*.' An unpublished M.Ed. Project. KU.

Wango, G. (2009). *School Administration and Management*. Nairobi: The Jomo Kenyatta

Warwick, Donald and Charles Lininger. (1975). *The Sample Survey:* Theory and Practice. New York: McGraw-Hill

Waters, T., Marzano, R.J. & McNulty, B. (2003). *Balanced Leadership: What 30 years of research tells us about the effect of leadership on student achievement.* Aurora, CO: Mid-continent Research for Education and Learning. [PDF added to *Educational Leaders* with permission].

Wayne, A. (2002*).* Teacher inequality: New evidence on disparities in teachers' academic skills*. Education Policy Analysis Archives*, 10(30*).* Retrieved June 30, 2002.

Wayne, A. J. & Youngs, P. (2003) Teacher Characteristics and Student Achievement Gains: A Review. *Review of Educational Research*, 73 (3): 89-122.

Wenglinsky, H., (2002). *The link between teacher classroom practices and student academic performance. Education Policy Analysis Archives, 10* (12).

Wiley, D., & Yoon, B. (1995). Teacher reports of opportunity to learn analyses of the 1993 California learning assessment system. *Educational Evaluation and Policy Analysis, 17* (3), 355-370.

Wilson, S.M. Darling-Hammond, L.D., & Berry, B. (2001). Steady work: The story of Connecticut's reform. *American Educator, 25* (3), 34-39, 48.

Wirth, K.R. & Perkins, D. (2013) Learning to learn www.macalester.edu/ academics/geology/wirth/learning.doc

Woesmann, L (2010): *Cross-Country Evidence on Teacher Pay.* Program on Education Policy and Governance, Working Paper Series, University of Munich and Ifo Institute, pp. 10-11.

Wolfenson, O. (2000). *The Role of Parents in Students Academic Performance in Bondo.*

Woolfolk, A.E., and Holy, K. W. (1990). "Prospective Teachers' Sense of Efficacy and Beliefs About Control." *Journal of Educational Psychology*, 82(1): 81-91.

Woolfolk-Hoy, A., & Spero, R. B., (2005). *Changes in teacher efficacy during the early years of teaching: A comparison of four measures. Teaching and Teacher Education, 21*, 343-356.

Worthington, A. (2001). An Empirical Survey of Frontier Efficiency Measurement Techniques in Education. *Education Economics*, 9(3): 245-268.

Wößmann, L. (2004). Institutions for Better Education. *CESifo DICE Report 4.*

Xu, Z., Jane H., & Colin, T. (2011). "Making a Difference? The Effects of Teaching For America in High School." *Journal of Policy Analysis and Management*, 30(3): 447 -469.

Yala, P. O. & Wanjohi, W. C. (2011). Performance Determinants of KCSE in Mathematics in Secondary Schools in Nyamira Division, Kenya. *Asian Social Science,* 7(20): 107-112.

Yamane, T, (1973). *Statistics* Commeyras, *an Introductory Analysis* (3rd ed.). New York:

Yara, P. O. (2009). Relationship between Teachers' Attitude and students' Academic in Mathematics in some selected schools in Southwestern Nigeria European Journal of social sciences volume11, Number 3. *http://wwwyara.com/about/ whereweoperate/ swedena.aspx Retrieved March 16, 2015*

Yara, P. O. and Catherine, W.W. (2011). Performance determinants of Kenya Certificate of Secondary Education in Mathematics in secondary schools in Nyamira Division, Kenya. *Asian Social Science, 7(20)*: 107-112.

Yara, P.O and Otieno, K. O. (2010). Teaching/Learning Resources and Academic Performance In Mathematics in Secondary Schools in Bondo District of Kenya, *Asian Journal of Social Science, 6*(12), 1126-132Yukl, G. A. (2002). *Leadership in organizations* (5th ed.). Upper Saddle River, NJ: Prentice-Hall.

Yusuf, M. A. & Adigun, J. T. (2010). The Influence of School Sex, Location and Type on Students' Academic Performance. *Int J Edu Sci*, 2(2): 81-85

Zientek, L. R. (2007). *Preparing high-quality teachers:* Views from the classroom.

APPENDICES

APPENDIX A: SECONDARY SCHOOL TEACHERS QUESTIONNAIRE

Dear Sir/Madam, .

Iam a postgraduate student at Moi University pursuing a Doctor of Philosophy (D. Phil) course. Iam conducting research on teacher factors and students academic achievement in KCSE in Baringo County, Kenya. You have been identified as a possible respondent for the above study based on the fact that you are a teacher in a public secondary school.Participation is entirely out of your own volition and very necessary for the success of this study.Your parcipation will no doubt enhance the usefulness of the research to the society.The findings of the study was handled with utmost confidentiality.

Yours faithfully

Charles Kiptum

0721765336

kiptumck@gmail.com

Instructions

Provide the required information by placing a tick in the appropriate cell or writing the answers in the provided spaces.

Section A: Biodata

1. Type of school National ( ) Extra-County ( ) County ( ) Sub-County ( )
2. Major teaching subject ……
3. Age in years 20 – 24 ( ) 25 – 34 ( ) 35 – 45 ( ) 46 & above ( ).

Section B: Qualification and experience

1. Highest level of education Diploma/S1 ( ) Degree ( ) Masters ( ) PhD ( )
2. Highest professional certificate in Teaching ……..
3. Number of Seminar/workshops for enhancing teaching capacity attended since you were employed ……
4. Number of years you have worked as a secondary school teacher …….
5. Number of years you have been teaching your

Section C: Teachers Instructional Leadership

The statements in the below table are on teachers instructional leadership, indicate the extent to which you agree with each by placing a tick (√) in the cell that best expresses your view. Use the given scale

Scale: Strongly Disagree (SD), Disagree (D), Not Sure (NS), Agree (A), Strongly Agree (SA

No	**Statement**	**Response**				
		SA	**A**	**NS**	**D**	SD
1	Teachers are part of the team that develops the academic calendar of a school					
2	Teachers influence instructional change					
3	Teachers serve as representatives of leadership building teams in school					
4	Teachers share their instructional strategies with colleagues to help them improve their instructional practices					
5	Teachers function as mediators between					

	the needs and responsibilities of school administration and the needs at the classroom level					
6	Teachers bring school administration and teachers together to solve instructional problems					
7	Teachers plan content delivery by preparing scheme of work/lesson plans					
8	Avail and organize instructional materials					
9	Teachers are the main facilitators in the search for knowledge in a classroom					
10	Teachers create a conducive learning environment in the classroom					
11	Teachers facilitates content delivery during lessons					
12	Teachers ensure learning takes place during lessons					
13	Teachers encourage students to attend classes and keep time					
14	Teacher instill in students a culture of learning					
15	Teachers guide students on how to solve problems					
16	Teachers motivate their students to excel in academic work					
17	Teachers help student understand difficult concepts through use of demonstrations and examples					
18	Teachers show students how to develop realistic study times and follow them					
19	It is the responsibility of teachers to organise and administer tests and assessment					
20	Teachers significantly influence their students' academic progress					
21	Preparing students to sit for national examinations is one of the key responsibilities of teachers					

Section D: Teachers Attitude towards teaching

Using the given scale indicate the extent to which you agree with the statements listed in the table below

Scale: Strongly Disagree (SD), Disagree (D), Not Sure (NS), Agree (A), Strongly Agree (SA)

No	**Statement**	**Response**				
		SA	**A**	**NS**	**D**	D
	Teaching profession					
1	Teaching is a rewarding profession					
2	Teaching is a profession that is respected by members of society					
3	The profession has many avenues for career growth					
4	The teaching profession is the choice of those without alternatives in life					
5	The teaching profession provides teachers with the opportunity to exploit their full potential					
6	Teachers consider teaching as a noble profession					
	Curriculum implementation					
7	Teachers enjoy preparing schemes of work/lesson plans					
8	Availing and organize teaching materials/aids for their lessons is a challenge to most teachers					
9	Teachers present the content of their lessons using a language that is easily understood by the learners					
10	Teachers always use student centered approach during lessons					
11	Teachers hardly use a variety of stimuli (gestures, face expression, encouraging words etc) during their lessons					
12	Teachers ensure that students actively participate in class during the lesson					
13	Teachers expose their students to demonstrations and practical work					
14	Teachers encourage their students to participate in group discussions/symposium					
15	Teachers do not guide their students on how to study on their own					
16	Teachers schedule, set and administer					

	CATs and tests to their students on time					
17	Teacher mark and record scores for assignments, tests and CATs					
18	Teachers analyse the results of assignments, tests and CATs and discuss them with the students.					
19	Teachers revise assignments, tests and CATs with the students					
20	Teachers use feedback from the students to improve his/her teaching					
21	Teachers never motivate learners in class					
22	Teachers do not demonstrate to students the correct ways to solve problems					
23	Teachers prepare students to sit for national examinations					

Thank you

APPENDIX B: CONTENT ANALYSIS

The following documents will analyzed during the study:

1. KCSE results for five years
2. Schemes of work preparation
3. Lesson plan
4. Records of work
5. Level of syllabus coverage
6. Student progress records

APPENDIX C: RESEARCH PERMIT

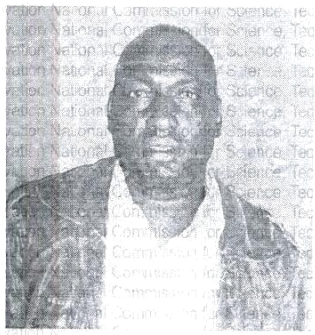
THIS IS TO CERTIFY THAT:
MR. CHARLES KIBET KIPTUM
of MOI UNIVERSITY, 0-20103 ELDAMA RAVINE,has been permitted to conduct research in *Baringo County*

on the topic: *CORRELATION BETWEEN TEACHERS RELATED FACTORS AND STUDENTS ACHIEVEMENTS IN PUBLIC SECONDARY SCHOOLS, KENYA*

for the period ending:
14th December,2015

.....
Applicant's Signature

Permit No : NACOSTI/P/14/3815/4309
Date Of Issue : 11th December,2014
Fee Recieved :Ksh 2,000



.....
Secretary
National Commission for Science, Technology & Innovation

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

NACOSTI

National Commission for Science, Technology and Innovation

RESEARCH CLEARANCE PERMIT

Serial No. A 3866

CONDITIONS: see back page

APPENDIX D: RESEARCH PERMIT

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349, 310571, 2219420
Fax: +254-20-318245, 318249
Email: secretary@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

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

Ref: No.

Date:

11th December, 2014

NACOSTI/P/14/3815/4309

Charles Kibet Kiptum
Moi University
P.O. Box 3900-00100
ELDORET.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research ***"Correlation between teachers related factors and students achievements in public secondary schools, Kenya,"*** I am pleased to inform you that you have been authorized to undertake research in **Baringo County** for a period ending **14th December, 2015.**

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

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

DR. S. K. LANGAT, OGW
FOR: SECRETARY/CEO

Copy to:

The County Commissioner
Baringo County.

The County Director of Education
Baringo County.

APPENDIX E: STUDY AREA