UNIVERSITY OF EDUCATION, WINNEBA

FACTORS THAT AFFECT LOW PERFORMANCE OF PUPILS IN MATHEMATICS AMONG JUNIOR HIGH SCHOOLS IN THE EFFUTU MUNICIPALITYITY

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DECLARATION

Student's Declaration

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

Signature: ……..

Date: ……..

Supervisors' Declaration

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

Name: Dr. Joseph Nyalar (Principal Supervisor)

Signature: ……..

Date: ……..

Name: Dr Clement Ali (Co-Supervisor)

Signature: ……..

Date: ……..

DEDICATION

To my wife, Dora Quansah and my children

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ABSTRACT

The study was conducted in selected public basic schools in the Effutu Municipalityity with the purpose of investigating the factors that affect the performance of pupils in mathematics in public junior high schools in the Effutu Municipalityity. The study sought to identify school, pupil, teacher, and home-related factors that affect the performance of pupils among junior high schools in Effutu Municipalityity. The study used a descriptive survey design. A proportionate random sampling procedure was used to select 110 junior high school pupils, and a purposive sampling procedure was used to select 10 mathematics teachers for the study. This gave a sample size of 120. The instruments used in this study were interview guides for mathematics teachers and questionnaires for junior high school pupils. The questionnaire responses were analysed descriptively using frequency tables, simple percentage counts, and mean deviations. Responses from the interview schedule were analysed qualitatively using a thematic approach. The study concluded that limited use of instructional materials in mathematics, limited number of mathematics teaching and learning materials (TLMs), large class sizes, high teacher-pupil ratio, lack of quality physical facilities, limited number of mathematics reading materials and other resources in the school library were school-related factors that affected pupils' performance in mathematics in junior high schools in the Effutu Municipalityity. Also, lack of commitment on the part of pupils, low academic ambition, pupils' poor learning styles in mathematics, pupils' lack of motivation for studying mathematics, pupils' lack of self-confidence, inadequate effort towards mathematics and lack of interest in mathematics studies were school-related factors that affected pupils' performance in mathematics in junior high school in the Effutu Municipalityity. Moreover, lack of mentorship for teachers, teacher impatience for slow learners, lateness to school, poor attitude towards learners, methods and techniques of teaching mathematics were teacher-related factors that affected pupils' performance in mathematics among junior high schools in the Effutu Municipalityity. Finally, parents' level of education, parents' occupation, parents' income, and family backgrounds, nutrition and health status, large family size, and parental involvement in academic work were home-related factors that affected pupils' performance in mathematics at junior high school in the Effutu Municipalityity. The study recommends that the Effutu Municipality Education Directorate provide the Effutu Circuit schools with adequate teaching and learning materials, provide adequate classrooms for teaching and learning, and also organise workshops for mathematics teachers on the efficient use of instructional materials during classroom deliveries. Also, teachers should liaise with parents of pupils to encourage, motivate, and stir pupils' interest in the learning of mathematics by giving special prizes to pupils who perform well in the subject. Finally, the Effutu Municipality Education Directorate should organise workshops or educational seminars for teachers on the need to develop positive attitudes towards their pupils so that the pupils can readily approach and relate with them.

CHAPTER ONE

INTRODUCTION

1.0 Overview

This chapter gives the background to the study, the statement of the problem, purpose of the study, research objectives, research questions, the significance of the study, delimitation of the study, and organization of the study.

1.1 Background to the Study

Education is considered as the first step for every human activity. It plays a vital role in the development of human capital and is linked with an individual's well-being and opportunities for better living (Battle & Lewis, 2002). In truth, quality education ensures the acquisition of knowledge and skills that enable individuals to increase their productivity and improve their well-being. All areas of life are based on effective knowledge of mathematics and science. Without knowledge of mathematics and science there will be no development in life. So, any country which is concerned about her development puts a great deal of emphasis on the study of mathematics (Blevins, 2009). Mathematics is said to be the driving force towards technological advancement. Its usage permeates almost every field of study including physics, chemistry, geology, engineering and medicine (Umameh, 2011). It is accepted universally that a strong foundation in mathematics is a pre-requisite for many careers and professions in today's rapidly growing technological society (Abimbade, 2015). The implication it claims for any country, especially a developing country like Ghana, is that progress in industrial and technological development calls for a work force that is well-grounded in mathematics.

The role of Mathematics in achieving the goals of education cannot be overemphasized as Mathematics has been identified as an indispensable link with such disciplines as physical sciences, economics, sociology, biology, linguistics, computer sciences, information theory, cybernetics, among others (Badmus, 2002). It is no exaggeration therefore to assert that Mathematics has become an important social factor. This is why the teaching of Mathematics with improving innovation has become necessary as Badmus (2002) opined that a basic Mathematics education for all children is not a luxury but absolute necessity (Ukeje, 2007).

described the importance and the attention given to Mathematics as stemming from the fact that without Mathematics, there is no science, without science, there is no modern technology and without modern technology, there is no modern society. Moreover, Serebour (2013) explains that the real reason for teaching mathematics is to ensure that all Ghanaian youth acquire the skills, ideas, attitudes and mathematical values they need to succeed in their careers and their daily lives.

However, pupils' performance in mathematics has become a serious threat to the educational progress and advancement of pupils in Ghana. The pupils' poor performance in mathematics has been fundamental for Ghana and the world at large, as evidenced by national and international reports (Poku, 2019). For example, the performance of BECE pupils over the last 18 years has been very worrying. The West African Examination Council (WAEC) reports suggesting that over 50 percent of the entire pupils who sat for the examination failed in mathematics and decline to about a 40-percentage point in 2000 to 2005 and 2006 to 2010 respectively (Okyere-Darko, 2011). The issue of pupils' performance in Mathematics at the Junior high school cannot really be attributed to a particular variable. There are several ways to evaluate a

student's quality attributable to formal education but the most tractable indicator is how he or she performs in tests (Sentamu, 2003).

Several factors have been identified as hampering academic work and pupils' performance in mathematics. For instance, Etsey, Amedahe and Edjah (2004) in their study of some private and public schools in Ghana revealed that academic performance is better in private schools due to more effective supervision of work. Thus, effective supervision improves the quality of teaching and learning in the classroom (Neagley & Evans, 2011). Also, the attitude of some school teachers and authorities to their duties does not engender good learning processes for the pupils. Some teachers leave the classroom at will without attending to their pupils because there is insufficient supervision by circuit supervisors. This lack of supervision gives the teachers ample room to do as they please. Another factor is lack of motivation and professional commitment to work by teachers (Young, 2009). This produces poor attendance and unprofessional attitudes towards pupils by the teachers, which in turn affect the performance of the pupils academically (Lockheed & Verspoor, 2014).

Some of the reasons attributed to the poor performance in mathematics by scholars include; shortage of qualified mathematics teachers, poor facilities, equipment and instructional materials for effective teaching (Gadanidis, 2012), use of traditional chalk and talk, large pupil to teacher ratio (Alele-Williams, 2008), mathematics phobia and fright (Georgewill, 2010), limited background preparation in mathematics, lack of mathematics teaching equipment and materials, anxiety, low level of interest and some government policies (Abimbade, 2015), lack of problem solving abilities, self-concept and achievement motivation (Umameh, 2011). Umameh (2011) claimed that many pupils are scared of mathematics and feel powerless in the presence of mathematical

ideas. They regarded Mathematics as difficult, cold, abstract, and in many cultures, largely masculine (Gadanidis, 2012).

Determinants of pupils' performance in mathematics have been the subject of on-going debate among educators, academics, and indeed policy makers and implementers (Abimbade, 2015). According to Abimbade (2015) there have been many studies that sought to examine the issue of determinants of pupils' performance and the findings point out hard work and discipline, previous schooling, parents' level of education, family income and self-motivation as factors that could explain differences in pupils' grades. Hence, mathematics learning and pupils' performance in mathematics receive considerable attention from educators, teachers and parents. It becomes highly imperative that the researcher identifies and recognizes the factors that could influence pupils' performance in mathematics so that they can be improved and able to make substantial academic progress.

1.2 Statement of the Problem

Mathematics is used throughout our daily lives. The importance of mathematics in day-to-day activities cannot be underestimated. However, pupils' performance in the subject has not improved significantly despite its importance. According to Poku (2019), pupils' performance in Mathematics over the years has become a challenging issue in Ghana such that the policy makers, the Ministry of Education and its allied agencies are making frantic efforts to curb the situation. Idowu (2015) argued that pupils' performance in mathematics at both internal and external examinations has remained considerably poor. Thus, researchers and educationists have been increasingly occupied in their attempt to identify factors that affect pupils' performance in mathematics.

A review of the report on the Trends in International Mathematics and Science Studies (TIMSS) of 2003 by Anamoah-Mensah and Mereku (2005) established that Ghana performed poorly in Mathematics at grade 8 (Junior High School, Form two). They found out that of the 46 countries that participated in the 2003 TIMSS test, Ghana was ranked 45th. Similar performance was recorded in 2007 and 2011 (Anamuah-Mensah, Mereku & Ghartey-Ampiah, 2008). The performance of pupils in Mathematics is generally assessed to be poor and therefore the suggestion to help pupils know or understand the relevance of the subject in the country's educational progression to drive change in pupils' attitude and performance (Chief Examiner's Report, 2011, cited in Poku, 2019).

Similarly, to-date, junior high school student level of performance in mathematics at the Basic Education Certificate Examination in the Effutu Municipalityity is very low. A study of the pupils' BECE results in mathematics in the Effutu Municipalityity from 2015 to 2018 shows that in the 2015 academic year, 671 candidates (pupils) were presented for the BECE. Out of this number, 198 candidates passed, representing 29.5% whilst 473 failed representing 70.5%. In the year 2016, the Effutu Municipalityity presented 926 pupils. Out of this, 264 passed representing 28.5% whilst 662 failed representing 71.5%. Again, in 2017 the Municipality presented 976 pupils out of which 283 passed and 693 failed representing 28.9% and 71.1% respectively. Additionally, in 2018, 891 pupils were presented. Out of this, 266 passed, 625 failed representing 29.9% and 70.2% respectively (Effutu Municipality Education Directorate, 2018)

The situation as described implies that many of the candidates were not qualified to enter the next stage of education (Senior High School) and stand the risk of socio-economic vulnerabilities. This has negative effects on the human resource development

of the Municipalityity and nation at large. The pathetic situation in the area raises questions about the depth of understanding and knowledge of the factors affecting pupils' performance in mathematics. The situation has also alarmed stakeholders in the sector and they have been seeking ways to investigate factors affecting the performance of pupils in mathematics. The researcher believed that if this scenario persisted, it meant that most of the pupils in junior high schools in Effutu Municipalityity would fail to progress in their education and their future would be blighted due to poor performance in mathematics. On the whole, the nation will lack the needed human capital and this will automatically affect the development of the nation. Hence, for any remedial action to be taken in the Effutu Municipalityity, the identification of the factors that affect the performance of junior high school pupils in mathematics is relevant.

1.3 Purpose of the Study

The purpose of the study is to investigate the factors that affect the performance of pupils in mathematics among public junior high schools in the Effutu Municipality.

1.4 Research Objectives

This study sought to:

1. Find out school related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipality.
2. Identify pupil related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipality.
3. Establish teacher related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipality.
4. Examine home related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipality.

1.5 Research Questions

The study is guided by the following research questions.

1. What are the school related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipality?
2. What are the pupils related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipality?
3. What teacher related factors affect pupils' performance in mathematics among junior high schools in the Effutu Municipality?
4. What home related factors affect pupils' performance in mathematics among junior high schools in the Effutu Municipality?

1.6 Significance of the Study

The findings of the study would go a long way in generating the much needed information that would be used by various stakeholders in the Municipality, particularly at the basic education level, to fashion out appropriate strategies to improve academic performance of pupils in mathematics. In this regard, the study would be useful to schools in the Municipality in the analysis of the factors that affect pupils' performance in mathematics in BECE.

Through this study, the results could be a guide that would help pupils, teachers and parents identify their areas of strength and weaknesses and make necessary adjustments to fill the gaps in their roles. The assessment would also help pupils think of their own learning and redirect their efforts where necessary and in appropriate direction of needs. The pupils would benefit by performing better academically, progressing successfully through the stages of education. They would therefore have more life opportunities and also improve their family lives and socioeconomic conditions.

The community would benefit from improved quality of education and successful pupils and citizens. The community would also obtain more contributions from its members. And at the macro level, identifying the factors that affects pupils' performance in mathematics at school is of great importance, because it would serve as an essential tool for Ghana Education Service and other policy makers in the design of education policies. This would eventually lead to a rise in the number of pupils who pass nationally. Lastly, the study was expected to add to the existing body of knowledge and act as a stepping-stone for later researchers in similar studies. It would also help future researchers who have the quest for improving education for all the learners in basic schools in Ghana.

1.7 Delimitation of the Study

The study was carried out in public junior high schools in the Effutu Municipality in the Central region of Ghana. Though there are both private and public junior high schools in the Municipalityity, the study was delimited to only the public junior high schools because poor academic performance in mathematics in the Basic Examination Certificate Examination (BECE) is more prevalent in the public junior high schools than their private counterpart. It is also worth mentioning that varieties of factors affect pupils' performance in mathematics, the study only focused on school, student, teacher and socio-cultural related factors that affect pupils' performance in mathematics.

1.8 Operational Definition of Terms

It is important to define some key concepts that have been used in order to clarify the context within which they are being used in this study.

Factors: Refer to school, pupils, teachers and socio-cultural variables that influence pupils' performance in mathematics either positively or negatively.

Academic Performance: Refers to junior high schools pupils' successful accomplishment in mathematical tasks.

Poor Performance: Refers to junior high school pupils' ability to perform below average mark in mathematical tasks.

School Related Factors: Refer to school environment that have either positive or negative on pupils' performance in mathematics.

Teachers Related Factors: Refer to teachers' variables that cause junior high school pupils to perform mathematical tasks successfully or unsuccessfully.

Pupil Related Factors: Refer to pupils' variables that cause junior high school pupils to perform poorly in mathematics

Home Related Factors: Refer to conditions that prevail in the home or community of junior high school pupils' that may hinder or promote their performance in mathematics.

1.9 Organisation of the Study

The study was organised into five chapters. Chapter One deals with the background to the study, statement of the problem, purpose of the study, objectives of the study, research questions, and significance of the study, delimitations, operational definition of terms and organization of the study. Chapter Two covered review of available literature relevant to the study, while chapter Three focused on the research approach, research design, and population of the study, sample and sampling procedures, research instruments, data collection procedure, data analysis procedure and ethical consideration. Chapter Four present data presentation, analysis and discussion Chapter Five presented the summary of the study, summary of key findings, conclusions, recommendations, limitations and suggested area for further studies.

1.10 Chapter Summary

In this Charpter, we have discussed the background to the study,statement of the problem and the purpose of the study.In particular, we have discussed four objectives and their corresponding four research questions. If well executed, the findings of the reseach will impact policy,practice and theory of teaching and learning.

We have also outlined the delimitation,operational definitions and organization of the study

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 Overview

According to Kreuger and Neuman (2006), literature review entails the examination of existing works closely related to the study. It focuses on what other scholars, researchers and theorists have said and done around the study topic. This chapter presents a review of related literature under the following subheadings; Theoretical Framework, Concept of Academic performance, School Related Factors That Affect Pupils Academic Performance, Pupils Related Factors That Affect Pupils Academic Performance, Teacher Related Factors That Affect Pupils Academic Performance, Home Related Factors That Affect Pupils Academic Performance, Summary of Review of Related Literature

2.1 Theoretical Framework of the Study

The study was underpinned by Bronfenbrenner's Ecological System Theory, Ford's Motivational System Theory and Weiner Attribution Theory.

2.1.1 Bronfenbrenner's ecological system theory

In 1979, Urie Bronfenbrenner's developed the ecological system theory. Bronfernbrenner Ecological System Theory focuses on quality and context of the child's environment. The interaction between child and environment may cause the child's physical and cognitive structure to grow and mature. These surroundings may help or hinder a child's developmental continuation. No matter what degree of exceptionality, how the child will eventually adapt to life and how the environmental forces surrounding the child facilitate or inhibit his or her development (Tulia, 2013).

Bronfenbrenner's ecological system theory states that a child's development is the result of interaction with environmental systems surrounding the child (Bronfennbener, 1979). The life of the child is in no way without a link to the interaction within the web of what Bronfernbrenner refers as ecology of the human development. It is assumed that the interactive ecology can provide to a child a platform (family, peers, public, and schools) that may either perpetuate something constructive or confusing. Bronfernbrenner (1979) as cited in Tulia (2013) calls the interactive development the ecology of human development where he placed the child in an ecological perspective. He argues that: the ecology of human development involves the scientific study of the progressive, mutual accommodation between an active, growing human being and the changing properties of the immediate settings in which the developing person lives, as this process is affected by relations between these settings and by the larger context in which the setting are embedded (p.21).

According to Bronfenbrenner the environment, is comprised of four layers of systems which interact in complex ways and can both affect and be affected by the person's development. These are Microsystems, Mesosystem, Ecosystems and Macrosystem. He later added a fifth dimension that comprises an element of time (Bronfenbrenner, 1989) which he called Chronosystem. This theory can be extended to model the development of an organization as well, and is particularly appropriate for describing the complex systems of a school, district, a region, or a whole nation. The four systemic categorization of Bronfernbrenner, as can be seen in figure 2.1 indicate different levels of interaction and influence from the general surrounding that a child encounters.

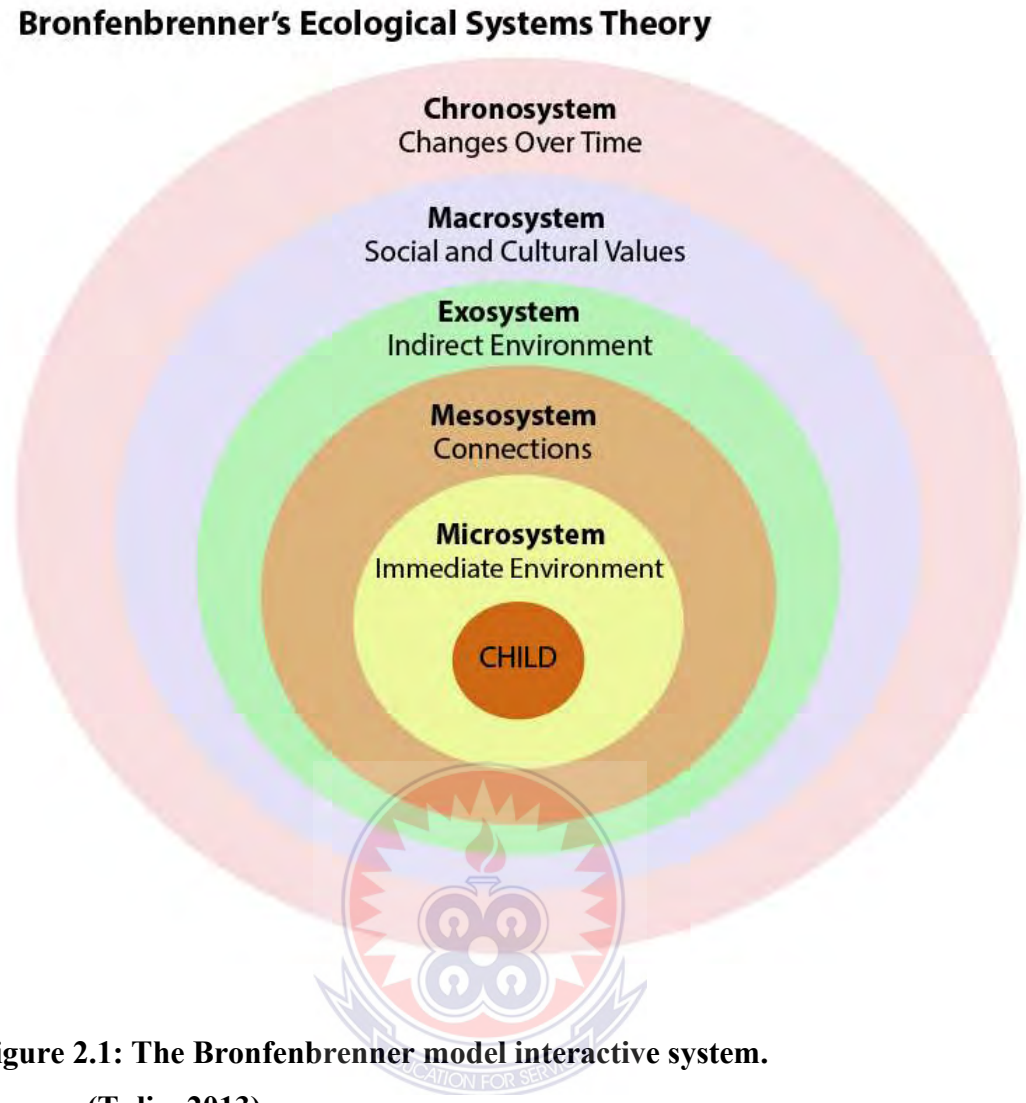

Figure 2.1: The Bronfenbrenner model interactive system.
Source: (Tulia, 2013)

The Micro-system is defined as the pattern of activities, roles, and interpersonal relationships experienced by a developing person in a particular setting with particular physical and material features and containing other persons with distinctive characteristics of temperament, personality, and systems of belief (Bronfenbrenner, 1995). In other words, this layer forms a set of structures with which a person has direct contact, and the influences between the developing person and these structures are bidirectional. Pupils are influenced by the Microsystem. The Microsystem of the school includes pupils, parents and family members, teachers, and the surrounding community

(Johnson, 2008). Thus, these can influence the student performance positively or negatively.

The meso-system, simply stated, comprises the linkages between Microsystems (Bronfenbrenner, 1995). Just as the direction of influence between the school and each structure within the Microsystems is bi-directional, the mesosystem involves bi-directional influences between these various structures. An example of the mesosystem of an individual school can be seen in the interactions and dynamics between two of its microsystems, pupils and parents. Parental expectations regarding the academic and extra-curricular success of their children can often create a dynamic that directly and indirectly impacts the atmosphere and climate of the school. Unreasonably high expectations and low tolerance for failure can create dynamics between parent and child that is characterized by tension and fear. This dynamic impacts the school in various direct and indirect ways, including, for example, student behaviour in the classroom resulting from such expectations, pressures to ensure their child's success placed on school personnel by the parent, or an attempt by school personnel to shield pupils from such parental pressures by restricting the amount of information that is communicated regarding student achievement (Johnson, 2008).

The exo-system represents the larger social system, and encompasses events, contingencies, decisions, and policies over which the developing person has no influence. The exosystem thus exerts a unidirectional influence that directly or indirectly impacts the developing person. The exosystem of an individual school might be comprised of such structures as, for example, state regulations, local economics, district mandates, and local disasters (Johnson, 2008).

The macrosystem can be thought of as the "social blueprint" of a given culture, subculture, or broad social context and consists of the overarching pattern of values, belief systems, lifestyles, opportunities, customs, and resources embedded therein (Bronfenbrenner, 1995). This system is generally considered to exert a unidirectional influence upon not only the person but the micro-, meso-, and exosystems as well. The macrosystem of an individual school is embodied not only in the cultural, political, social, and economic climate of the local community, but that of the nation as a whole (Johnson, 2008).

Although not one of the four system layers per se, the chronosystem represents a time based dimension that influences the operation of all levels of the ecological systems. The chronosystem can refer to both short- and long-term time dimensions of the individual over the course of a lifespan, as well as the socio-historical time dimension of the macrosystem in which the individual lives. The chronosystem of an individual school, therefore, may be represented by both the day-to-day and year-to-year developmental changes that occur in its student body, teaching staff, curricular choices, etc., as well as the overall number of years in operation (i.e., a newer school faces challenges and opportunities that differ from those of a school that has been in operation for a length of time).

Leonard (2011) conducted a study on using Bronfenbrenner's Ecological Theory to Understand Community Partnerships: An Historical Case Study of One Urban High School. It was found that Successful partners achieved "cultural cohesion" by building collaborative relationships that encircled pupils, while failed partnerships ignored ecological theory. Thus, this study used Bronfenbrenner's Ecological Theory to understand how the environment affects pupils' performance in mathematics.

2.1.1.1 Application of Bronfenbrenner's ecological system theory to the study

The relevance of this theory to the study is that it impinges on the researcher to view the factors that affect pupils' performance in mathematics in the school as a phenomenon that is influenced by wider social systems. The theory opined that school children are directly present within social systems, such as their household, school and immediate neighbourhood, and there are others in which they are not directly represented, but which impinge on their development including their siblings, social networks and their parents or carers, friendship, leisure and the workplace relationships (Bronfenbrenner, 1986). In addition, the theory makes us aware of the influences of wider social systems including the cultures, political systems, social institutions, and values that exist in the society and argues that they should be taken into account in children's educational upbringing. By inference, the influences and experiences that result from the interactions between different social systems play a key role in determining the extent to which student perform in school. From the constructs of the ecological theory, the performance of pupils in mathematics is inextricably linked with the characteristics of social systems in the Municipalityity.

2.1.2 Ford's motivational system theory

In 1992, Martin Ford's developed a motivational system theory. Ford selected 32 motivational theories, identifies their limitations and addresses them and incorporates them into one comprehensive framework. Theories cited include both classic and contemporary theories of motivation including Social Cognitive Theory, Psychoanalytic Theory, Achievement Goal Theory, and Field Theory, to name a few (Richardson, 2009). Ford's motivational systems theory does not attempt to replace or supersede any of the existing theories. Instead, it attempts to organize the various motivational constructs from different theories into one model. The main constructs are

self-efficacy beliefs, the role of expectancy, and goal orientation (Baidoo-Anu, 2017). According to Ford, these terms refer to "where people are heading and what they are trying to do", how people get "turned on or off" ", and "how people decide to try something, stick with it or give up" (Richardson, 2009, pg. 30). Ford refers to these as personal goals, emotions and personal agency beliefs and stresses that these elements work in conjunction with each other to produce behaviour

Ford Motivational System Theory is grounded in the premise that motivation provides the psychological basis for individuals' development of competence and a desired consequence of motivation is achievement, the attainment of a personally or socially valued goal within a specific context" (Colbeck *et al.,* 2002, p. 2). It means that, achievement and competence are the results of a motivated, skilful and biologically capable person which interact with a responsive environment (Ford, 1992 cited in Baidoo-Anu, 2017). In the motivational systems theory, motivation is defined as the organized patterning of three psychological functions that serve to direct, energize, and regulate goal-directed activity: personal goals, emotional arousal processes, and personal agency beliefs" (Ford, 1992, p. 3). Ford represents this relationship with the following heuristic (i.e. nonmathematical) equation:

Motivation = *Goals* X *Emotions* X *Personal Agency Beliefs*

Therefore, motivation is an interactive construct representing the direction a person is going, the emotional energy and affective experience supporting or inhibiting movement in that direction, and the expectancies that a person has about reaching their destination or achieving their goals. MST does not prefer or rank, any one of the three components but it views all three components as functioning in an interdependent triumvirate process. If any one of the components is absent in a particular episode, and

then the subject will not be motivated to initiate activity even though the other two components are firmly in place (Ford, 1992). The strength of Motivational Systems Theory (MST) is that it addresses the problems of conceptual narrowness, lack of cohesion and consensus and lack of practical utility common to many other theories of motivation.

In the academic environment, pupils who are motivated to learn should persist at tasks when they encounter obstacles. Researchers frequently utilize persistence as a valid and measurable component of motivation. Brown and Inouye (1978) cited in Baidoo-Anu (2017) had college pupils solve anagrams and on completion they were informed that they had performed as well as the model. The pupils were then made to observe another model which failed, and were made to attempt the same anagrams as the failed model. The pupils outperformed that model, showing that the pupils were more competent than the model, which led to higher self-efficacy and persistence. Student achievement may be viewed as an indirect index or measure of motivation (Baidoo-Anu, 2017).

Application of Ford's motivational system theory to the study

This theory provides the understanding that student's performance or achievements are the result of a motivated and skilful student interacting with a responsive environment. Thus, if the school environment, home conditions, teacher factors and student's factors are favourable, student stand a better chance of performing well academically.

2.1.3 Weiner attribution theory

In 1972, Bernard Weiner developed attribution theory. Attribution theory deals with the question of how individuals make judgments and seek to explain how they consider the causes of their behaviours and those of others (Weiner, 1985 cited in Baştürk, 2016). Attributions have the potential to affect beliefs, emotions and behaviour. Therefore,

attribution theory has significantly contributed to the studies on motivation (Baştürk, 2016). Heider (1958) cited in Culatta (2020) was the first to propose a psychological theory of attribution, but Weiner and colleagues developed a theoretical framework that has become a major research paradigm of social psychology.

Weiner's attribution theory states that an individual's causal attributions of achievement affect subsequent behaviours and motivation. Weiner focused his attribution theory on achievement (Weiner, 1974). He identified ability, effort, task difficulty, and luck as the most important factors affecting attributions for achievement. Attributions are classified along three causal dimensions: locus of control, stability, and controllability (Culatta, 2020). People may think that outcomes happen independently or dependently of how they behave. This is related to the internality-externality dimension of causal attributions and it is called as the locus of control (internal or external). Locus of control affects pupils' achievement. Pupils who accept their role in their successes and failures should be more motivated to participate in academics tasks; they expend effort and persist more than those who completely or partly disaffirm the effect of their behaviours on outcomes (Baştürk, 2016). At the same time, a causal attribution may vary or not over time. The degree of an individual's effort may temporarily become different. Luck is also changeable. One moment our luck can be with us another moment it may leave us. However, task difficulty is relatively stable and task conditions almost always remain the same. This feature of causal attributions is included in the stability dimension (stable or unstable).

The controllability addresses whether the attribution is personally or externally controllable or uncontrollable. An individual may control his/her effort into a task; therefore the effort is a controllable cause. However, being ill is not something under

the control of individuals. They may not choose to be ill or not. In the achievement settings, ability, effort, task difficulty, and luck are often used by pupils to explain their successes and failures (Weiner *et al.,* 1972 cited in Baştürk, 2016).

It is difficult to expect pupils, who consider their control over academic achievement as little, to have high hopes for success and high motivation to be successful (Baştürk, 2016). In the face of failure, pupils who perceive themselves as having low ability, experience difficulties in classroom engagement (Baştürk, 2016). The locus dimension can influence affective reactions. Attributing an outcome to internal causes may lead an individual to experience greater pride in the case of success or greater shame in the case of failure (Weiner, 1992 cited in Baştürk, 2016). As long as task conditions do not change much, pupils who attribute outcomes to stable causes such as high ability, low task difficulty may demonstrate higher expectations for subsequent successes than those who explain them with unstable causes such as immediate effort and luck (Schunk, 2012).

In order to increase pupils' success in mathematics, it is important to determine factors that lead pupils to fall behind academically. In this subject, attributions and their dimensions offer teachers a good starting point (Shores & Smith, 2010). Mathematics is perceived as the most difficult lesson by most of the people. Therefore, attributions have a particular importance for teachers and math education researchers. Shores and Smith (2010), in their literature review study on attribution studies in mathematics from 1974 through 2008, identified studies since 2000 and underlined the necessity of continuing studies on attribution that is vital to pupils' success in mathematics. More specifically, to increase the success of mathematics pupils, especially the low achievers'

success, the fact that researchers and (student) teachers understand the nature of causes which lead these pupils to experience difficulties is very important.

Application of Weiner's attribution theory to the study

The rationale for adopting attribution theory in this research is an attempt to identify and explain the internal and external factors which contribute to school children's academic performance in mathematics. Pupils with higher ratings of self-esteem and with higher school achievement tend to attribute success to internal, stable, uncontrollable factors such as ability, while they contribute failure to either internal, unstable, controllable factors such as effort, or external, uncontrollable factors such as task difficulty. For example, pupils who experience repeated failures in calculations are likely to see themselves as being less competent in mathematics. This self-perception of mathematics ability reflects itself in children's expectations of success on mathematics tasks and reasoning of success or failure of mathematics.

Weiner (1980) cited in Culatta (2020) states: "Causal attributions determine affective reactions to success and failure. For example, a student is not likely to experience pride in success, or feelings of competence, when receiving an 'A' from a teacher who gives only that grade. On the other hand, an 'A' from a teacher who gives few high grades generates great positive affect. This indicates that, teachers have the potential of influencing the performance of school children. From the attribution theory, it implies that teachers have a role to educate parents about attributions of their children by providing feedback and comments about behaviour, attitude and academic performance of their school children (Topor *et al.,* 2010).

2.2 Concept of Academic Performance

According to Mankoe (2002), performance refers to the extent to which a worker or student contributes to achieving the goals of his or her institution and an individual with weak motivation might perform well owing to some chance factors that boost performance. This means that performance measures the aspect of behaviour that can be observed at a specific period. To determine performance, a performance test is conducted. Singer (1981) cited in Baidoo-Anu (2017) defined performance test as the type of mental test in which the subject is asked to do something rather than to say something. Performance test is the type of test which throws light on the ability to deal with things rather than symbols (Baidoo-Anu, 2017).

Cary, Roseth, David and Roger (2008) define academic achievement as performance on task with measures including comprehension, quality and accuracy of answers of tests, quality and accuracy of problem solving, frequency and quantity of desired outcome, time or rate to solution, time on task, level reasoning and critical thinking, creativity, recall and retention, and transfer of tasks. To Otoo, (2007) academic performance constitutes what a student is capable of achieving when he or she is tested on what he or she has been taught. It is further stated that academic performance is related to intellectual capacity (Otoo, 2007). Also, Academic performance refers to how pupils deal with their studies and how they cope with or accomplish different tasks given to them by their teachers in a fixed time or academic year (Dimbisso, 2009 cited in Tanieth, 2013).

Gleaning from above, academic performance can, therefore, be defined as consisting of pupils' scores obtained from teacher-made tests, first term examinations, mid-semester tests and so on. The researcher focused on the pupils' performance in mathematics in

the form of aggregates in public examinations such as the Basic Education Certificate Examination (BECE) in Ghana.

2.3 Factors that Affect Pupils' Performance in Mathematics

Al-Agili, Mamat, Abdullah and Maad (2012) pointed out that several factors affect pupils' performance in mathematics. They list factors such as pupils' personal attitudes towards mathematics, classroom climate, mathematics anxiety, teachers' attribution as lack of experience in mathematics teaching and shortage of qualified mathematics teachers, teaching practices and teaching methods and pupils' beliefs toward mathematics (Al-Agili *et al.,* 2012).

In addition, Mbugua, Kibet, Mathaa and Nkonke (2012) found that school based factors, socio-cultural factors and personal factors affect pupils' performance in mathematics. These factors contribute to poor performance which include under staffing, inadequate teaching/ learning materials, lack of motivation and poor attitudes by both teachers and pupils, retrogressive practices. Numerous factors were identified by some researchers for the poor performance by pupils in mathematics. For instance, Anamuah-Mensah (2010) attributed the phenomenon to lack of effective supervision and monitoring at school, lack of motivation for teachers and inadequate number of qualified teachers to fill empty classrooms. Also, Diaz (2003) found factors such as intellectual ability, poor study habit, achievement motivation, lack of vocational goals, low self-concept, low socioeconomic status of the family, poor family structure and anxiety as contributing to pupils' performance.

2.3.1 School related factors that affect pupil's academic performance

School learning environment encompasses the factors within the school that may or may not provide suitable conditions for the promotion of effective teaching and

learning. Several school environmental factors have generally been identified as influencing academic performance (Ethington & Smart, 2001). Ethington and Smart (2001) pointed out these factors include availability of instructional materials (teaching and learning materials), school location and quality of the physical facilities, class size and pupil-teacher ratios, teacher qualification and experience, and supervision (Ethington & Smart, 2001).

First and foremost, Estsey (2005) indicated that, teaching and learning materials availability determines the level of academic performance. The author added that, where these materials (i.e. textbooks, laboratory equipment, carpentry tools, etc.) are not accessible to both teachers and pupils, it can cause low academic performance as teaching and learning becomes ineffective, and in the end becoming unsuccessful. Cooper and Robinson (2010) found out that the availability and use of teaching and learning materials affect the effectiveness of a teacher's lessons since it makes teaching and learning practical. This is because the use of teaching and learning materials will influence pupils' comprehension of lessons. Also, Etsey (2005) found teaching and learning materials to be less adequate in the Shama sub-metro schools. Since there were less TLMs in the Shama sub-metro schools, the situation made it difficult for the pupils to understand the lessons and this led to lower performance.

In addition, the school location and quality of the physical building affect the performance and achievement levels of pupils. Harbison and Hanushek (1992) cited in Adane (2013) stated that the quality of the physical facilities is positively related to student performance. Harbison and Hanushek (1992) cited in Zambaga (2017) affirmed that the excellence of the physical facilities provide the required ambience which positively determines positive student performance in their respective schools. This

assertion substantiates that of Darling–Hammond (2000) who indicated that high-quality sitting arrangement and buildings produce lofty academic accomplishments and performance, while rundown school buildings that are without psychological inspiring amenities together with poor or no sitting arrangements is unhelpful and negative. According to Asikhia (2010) where the school is located determines to a very large extent the patronage such a school will enjoy. Similarly, the entire unattractive physical structure of the school building could de-motivate learners to achieve academically. Engin-Demir (2009) argue that attending a school with a better physical environment is associated with increased maths scores. Adepoju (2001) found that pupils in urban schools manifest more brilliant performance than their rural counterparts.

Moreover, Kusi and Manful (2019) found that class size is a significant factor of academic performance and that studies have indicated that schools with smaller class sizes do better academically than schools with larger class sizes. Similarly, a Ghanaian study by Kraft (2009) concluded that a class size above 40 has negative effects on pupils' achievement. In support of the effect of class size on academic performance, another researcher added that, since children have differences in drive, interests, and abilities and that they also differ in health, personal and social adjustment, and creativity, generally good teaching is best done in classes with smaller numbers that allow for personal attention (Reutzel & Cooter, 2010). Adunola (2013) found that pupils in the smaller classes performed better academically than those from larger class sizes. Achilles, Harman and Egelson (2010) revealed that large class size negatively affects pupils' academic performance.

Furthermore, schools with effective supervision of teaching and learning activities have high performance rates. Etsey, Amedahe and Edjah (2004) in a study of 60 schools

from peri-urban (29 schools) and rural (31 schools) areas in Ghana found that academic performance was better in private schools than public schools because of more effective supervision of work. According to Etsey (2005) if circuit supervisors are more regular in schools, this would put the teachers on the alert to be more regular and early in school. This would forestall teacher absenteeism and improve teaching in the schools. If teachers are present always following regular visits of circuit supervisors, pupils would be challenged to change their attitudes toward school.

Baral (2011) conducted a study entitled "cause of failure in mathematics in SLC Examinitation (A case study of school in Bharatpur). In study he found School related factors are associated with school environment, physical facilities, teacher's behaviours, peer's behaviours, managed library, classroom environment, regularity of teachers and pupils, Instructional teaching materials etc. and out of school related factors are associated with family background, interest of learners toward mathematics, amount of time that student spent on school activities such as leisure reading , homework, discussion with peers, economical condition, motivation etc effect mathematics achievements through qualitative as well as descriptive research. Similarly, this study intends to determine school related factors that affect performance of pupils in mathematics among public junior high schools in the Effutu Municipalityity.

2.3.2 Student related factors that affect pupils' academic performance

According to Acharya (2017), student's related factor is one of the important aspects of high fail rate in mathematics plays vital role in a teaching learning process. Without pupils interest in the teaching learning actives there is no possibility to achieve knowledge in subject matter. Student's achievement depends on their need, interest, practices and seriousness in subject matter. Pupils related factors include mathematics

anxiety, prior knowledge of pupils and student's labour in learning mathematics (Acharya, 2017). Also, Tanieth (2013) pointed out that pupils' performance in school is determined by various characteristics including time spent with books and homework, attendance in school, pupils' attitude towards schooling and motivation of pupils among others (Tanieth, 2013).

School attendance has a high correlation with individual academic achievement. The success of a student in school is predicated on regular school attendance. According to Allen-Meares, Washington and Welsh (2000) poor attendance such as truancy or unexcused absence from school, cutting classes, tardiness, and leaving school without permission is seen as important in determining pupils' academics. Akabayashi and Psacharopoulos (1999) cited in Adane (2013) found that additional working hours decrease a child's reading and computational ability, whereas with additional hours of school attendance and study the reading and computational ability increased. From their findings, Ray and Lancaster (2003) concluded that time spent at work had negative impact on education variables with marginal impact weakening at higher levels of study hours. Unbalanced demand of work and education places a physical and mental strain on pupils and often leads to poor academic performance.

Also, motivation is considered to be the element that initiates the pupil's own involvement in learning. When a student is strongly motivated, all his/her effort and attention are directed toward the achievement of a specific goal, thus bringing to bear all his or her resources (Diaz, 2003). In addition, pupils' academic achievement motivation is influenced by the student's perception of parental support and involvement. If pupils' perception is positive on their parents' support and involvement, they achieve well (Baidoo-Anu, 2017). Gottfried (1994) cited in Baidoo-Anu (2017)

revealed that parental motivational practices have significant direct effects on academic intrinsic motivation, and indirect effects on subsequent motivation and achievement. Fuchs and Woessmann (2004) observed that pupils performed significantly worse in reading, maths and science in schools whose principals reported that learning was strongly hindered by the lack of parental support.

Moreover, Engin-Demir (2009) stated that regardless of intelligence, pupils who spend more time on assignments and homework are able to improve their grades. Butler (1987) cited in Etsey (2005) found that the amount of time pupils invest in homework and other related activities have also been found to be strongly related to motivation. Etsey (2005) found homework to be a correlate of academic performance. He stated that "homework bore a positive relationship with learning outcomes when it is relevant to learning objectives, assigned regularly in reasonable amounts, well explained, motivational and collected and reviewed during class time and used as an occasion for feedback to pupils" (p. 3). Homework is in reality an interaction between school and the home, and an essential ingredient of the educational process when measuring academic achievement (Harbison & Hanushek, 1992 cited in Tanieth, 2013). Stricker and Rock (1995) cited in Baidoo-Anu (2017) conducted an analysis by assessing the impact of the pupil's initial characteristics (gender, ethnicity, parental education, geographic region and age) and the academic performance. They found that the pupils' initial characteristics have a modest impact on their academic performance and among them parental education was the most significant.

Lastly, several researchers have investigated the significant role of pupil attitudes toward learning with regard to their academic achievement. Pupils' attitudes such as absenteeism, truancy, indiscipline, etc can affect their performance. For instance,

McLean (1997) cited in Baidoo-Anu (2017) found, by distinguishing between the attitudes of high and low achievers,that five attitudinal factors were significantly related to academic performance. Pupils' attitudes may not only directly affect academic achievement, but also may indirectly influence the effect of other factors as well. In another study, Abu-Hilal (2000) found the effect of attitudes on student level of aspiration. Despite the difference between the findings of these two studies, the authors achieved consensus as regards to the significance of attitudes in predicting achievement. House (1997) and Hassan (2002) further complemented the results of earlier studies, with the former proving that the pupil's initial attitude towards school was significantly related to academic performance, while the latter found that attitudes predicted the pupil's basic approach to learning.

Nyandwi (2014) sought to investigate the pupils' factors influencing poor academic performance of secondary schools pupils in Sumbawanga District, Tanzania. The finding reveals that truancy and incompetence of English language of some pupils reduces the efficiency in their academic works. Hence, this study intends to examine student's related factors that affect the performance of pupils in mathematics among junior high schools in the Effutu Municipalityity.

2.3.3 Teacher related factors that affect pupils' academic performance

A number of teacher-related factors have been identified as having significant influence on student academic performance. According to Acharya (2017) teacher related factors are the one aspect of low pass rate in mathematics at junior and secondary level. Teacher is a person who provides education for pupils individually and motivate for teaching learning activities. The children's education depends on the role of teacher in teaching learning activities. Positive attitude of teacher creates positive direction to pupils for learning mathematics (Acharya, 2017). To Tanieth (2013) some teacher factors which

determine academic performance include; the quality of teachers, levels of subject knowledge, teacher absenteeism and shortage of teachers. Similarly, Adane (2013) pointed out that several teacher factors influence academic performance. These include teacher attendance in school, teachers' interest and motivation, and teaching effectiveness and methods of teaching.

Musili (2015) in his study to investigate the influence of teacher related factors on pupils' performance in Kenya Certificate Secondary Education in public schools in Kibwezi Sub country concluded that teacher's professional qualification affects student achievement and that teachers consider teaching as an opportunity of service for pupils and that they provided guidance in their free time to their pupils in their academic/non-academic areas. It was concluded that professional experience has an influence on student's performance. The study concluded that teacher's professional qualification affects student achievement and that teachers consider teaching as an opportunity of service for pupils and that they provided guidance in their free time to their pupils in their academic/non-academic areas. It was concluded that professional experience has an influence on pupils' performance in KCSE.

In another study, Fobih, Akyeampong and Koomson (1999) cited in Baidoo-Anu (2017) arrived unannounced in 60 schools in the Central region of Ghana and found that about 85 per cent of teachers were late to school. Lateness ranged from five minutes up to one and a half hours. This meant teaching time was lost, teachers taught fewer school subjects (i.e. taught mainly English and Mathematics out of 10 subjects), and the school day for pupils was shortened. Etsey, (2005) in a study at Shama metro found out that lateness and absenteeism affected completion of syllabi. When the syllabus is

not completed, pupils find it difficult to understand content that is to be taught in the next class which foundation in most cases is based on the previous class.

This assertion supports Pryor and Ampiah (2003) who in a study to understanding education in an African Village and the impact of information and communication technologies in villages in Ghana, found out that most children do not follow school work because they do not possess the understanding from previous work that is prerequisite for the syllabus of the higher grades of primary school and junior secondary school. The study also found that most children are unable to follow the main 'text' of school lessons, which is constructed by the teacher assisted by one or two higher achieving pupils and by ritual responses from the rest of the class. The study again found that understanding of pupils is especially bad when English is used, as most children cannot speak more than a few basic phrases.

Moreover, Ofoegbu (2004) linked poor academic performance of pupils to poor teacher's performance in terms of accomplishing the teaching task, negative attitudes to work and poor teaching habits which have been attributed to poor motivation. Corroborating this position, Lockheed and Verspoor (1991) cited in Tanieth (2013) asserted that lack of motivation and professional commitment on the part of teachers produced poor attendance and unprofessional attitudes towards pupils which in turn affect the performance of pupils academically.

Furthermore, Adane (2013) found out that teacher factors such as incidence of lateness to school and absenteeism, inability to complete the syllabi and inadequate homework assigned to pupils contributed to the low academic performance of pupils from Kemp Methodist JHS in Aburi, eastern region of Ghana. The role of the teacher in achieving academic excellence is very important so lateness to school on the part of the teacher

affect the pupils greatly. Teacher's lateness to school affects their output of work and this can be seen in them not being able to complete their syllabi before pupils write their final examination. Giving homework to pupils is a way of ensuring that pupils continue to learn after school so if teachers do not give them regularly this does not encourage the lazy pupils to learn after school and this affects them academically.

Lastly, Darling-Hammond (2000) found that teacher quality characteristics such as certification status and degrees in subject to be taught are very significant and positively correlated with subject outcomes in science and mathematics. Ingersoll (1999) cited in Zambaga (2017) found out that 63 per cent of chemistry, physics, earth and space science instructors do not have certification in the subjects and this result in the poor performance of pupils in American Secondary schools. Also, Greenwald, Hedges and Laine (1996) cited in Adane (2013) found academic achievement to be positively correlated with teacher qualification. Additionally, Abuseji (2007) found teacher's qualification to be the second most potent causal effect on student's achievement in chemistry. Its direct and indirect effect accounted for 4.37 per cent, and 5.00 per cent of the total effect on pupils' achievement in chemistry in Lagos state, Nigeria. Thus, this study intends to determine teacher related factors that affect the performance of student in mathematics among junior high schools in the Effutu Municipalityity.

2.3.4 Home related factors that affect pupils' academic performance

Adane (2013) pointed out that whether a child performs well in school can be influenced by a range of household factors. These include socio-economic status (education, occupation and income), size of the household, type of discipline at home, family structure, and the level of parental involvement and interest in child schooling are all factors which affect performance in school. In addition, Zambaga (2017) argue that the discourse on home factors that influence learning primarily focuses on family

structure, parental involvement in pupils' academic work, income level of family, and parental level of education.

According to Kyoshaba (2009) low social economic status negatively affects academic achievement because low social economic status prevents access to vital resources and creates additional stress at home. Majoribanks (1996) cited in Baidoo-Anu (2017) defined socio-economic status (SES) as a person's overall social position to which attainments in both the social and economic domain contribute. When used in studies of children's school achievement, it refers to the socio economic status of the parents or family educational level, occupational level and income level (Jeynes 2002). Farooq, Chaudhry, Shafiq, Berhanu (2011) examined different factors influencing the academic performance of secondary school pupils in a metropolitan city of Pakistan. The study concluded that the higher level of socio-economic status (SES) is the best indicator contributing towards the quality of pupils' achievement. Family characteristics like socio economic status (SES) are significant predictors for pupils' performance at school besides the other school factors, peer factors and student factors. The study also found out that parental education also has positive effects on pupils' academic performance. Parental occupation has little effect on their child's performance in studies than their education.

Also, Ushie, Emeka, Ononga and Owolabi (2012) indicated that high level of parental involvement in children's education positively affects their learning potentials. For instance, it was discovered that parents that are very much involved in the educational activities (i.e., engagement in homework and attending parent-teacher association meetings) of their children enable them to have good academic performance (Eweniyi, 2010). In this regard, the poor academic performance of children emanates from parents

lack of proper supervision of their wards' homework. However, Topor, Keane, Shelton and Calkins (2010) found that parents were not involved in any meaningful way in the literacy development of beginning readers.

Moreover, Ogbemudia and Aiasa (2013) discovered that, parental education is considered a major determinant of a child's academic performance as it influences the pupils' learning attitude. In a separate study, Acharya and Joshi (2009) found that parents' education can affect the achievement drive of their children in their academic endeavours. More so, Svinicki and McKeachie (2009) found that parental level of education influences academic performance of their wards. This means that parents with less or no education are likely to have their wards performing poorly academically owing to the fact that, their status in society might not permit them to contribute positively to the academic performance of the pupils. However, some people with illiterate parents have excelled academically which challenges these empirical findings.

Furthermore, family income according to Escarce (2003) has a profound influence on the educational opportunities available to adolescents and on their chances of educational success. Escarce (2003) added that due to residential stratification and segregation, low-income pupils usually attended schools with lower funding levels, have reduced achievement motivation and much higher risk of educational failure. Kinyanjui, as cited in Wamulla (2013) in a study in Maasai of Tanzania saw that limited income among low class families was found to restrict provision for school books and other necessary materials necessary for attendance and good performance in school.

Ndiritu (1999) cited in Baidoo-Anu (2017) in his study to find the factors that influence performance in selected public schools in Nairobi and Central provinces in Kenya found no correlation between socio-economic background and academic performance

but found that poor children are regularly sent home from school because of inability to pay school levies. According to Eshiwani (1993) cited in Tanieth (2013) said good socio economic conditions facilitates studies while poor ones hinder them. A big number of children fail because of poor financial state of the parents. The atmosphere at home negatively affects pupils in school. Socio cultural customs and beliefs influence decisions to withdraw pupils from school; impacting negatively on their academic performance (Tanieth, 2013). It is also observed that the economically disadvantaged parents are less able to afford the cost of education of their children at higher levels and consequently they do not work at their fullest potential (Rouse & Barrow, 2006).

A study by Amukowa and Karue (2013) set to find out factors affecting performance in Kenya Certificate of Secondary Education in day secondary schools in Embu District of Eastern Province, Kenya. The study found out many factors which influenced the negative performance of day secondary school pupils in Embu District.

Those factors which came out clearly were explained by the social and economic status of the general population of the Embu community which could best be described as poor. The poverty index, thus, plays a pivotal role in the poor performance in Kenya Certificate of Secondary Education in Embu District. They further found that home environments of the pupils and their family backgrounds impacted negatively on their performance. In addition, pupils were not able to read effectively while at home because they lacked reading materials, they were interfered with friends, family members, poor lighting facilities and noise pollution from neighbours. All these factors were found to be major problems hindering day secondary school pupils from studying. Similarly, other problems were bad company at home, staying long distances from school and lack of proper accommodation.

Lastly, Akanle (2007) studied socio-economic factors influencing pupils' academic performance in Nigeria. The study revealed that insufficient parental income influences pupils' academic performance. Jing-Lin, Gang and Wei (2009) found that perceived importance of learning success to family, English writing ability and social communication with their compatriots are significant predictors of international pupils' academic achievement. Thus, the current study intends to examine the home related factors that affect the performance of pupils in mathematics among junior high schools in the Effutu Municipalityity.

2.4 Summary of Related Literature Reviewed

Identifying the most contributing factor that affect student academic performance is a very complex and challenging job. The pupils in public schools belong to a variety of backgrounds depending upon their demography. This diversity is much vast and complex as ever before in the Effutu Municipalityity. Literature has been reviewed on issues related to the study. These included student related factors such as school attendance; motivation; intelligence level and student attitudes, home related factors such as family structure; the level of parental involvement; size of the household and type of discipline at home, school related factors such as school location; class size; pupil-teacher and supervision; and teacher related factors such as quality of teachers; teacher absenteeism and shortage of teachers that affect pupils' academic performance. Again, bronfenbrenner's ecological system theory, Ford's motivational system theory and Weiner's attribution theory were the theories underpinning the study. However, the literature reviewed does not address the questions raised by this research in the study. Knowledge on factors that affect the performance of pupils in mathematics in the study is limited. Thus, to fulfil this gap, this research has been conducted.

2.5 Chapter Summary

In this chapter we have discussed the theoretical framework of the study,Bronfenbreners Ecological system theory, Application of Bronfenbrenner's Ecological System theory to the study, Application of Ford'Motivation theory to the study,weinner's attribution theory and Application of weinner's attribution theory to the study.

We also discussed the concept of Academic Performance;specifically factors that affect pupils' performance in Mathematics, school related factors that affects pupils' academic performance in Mathmatics, student related factors that affect pupils'academic performance in Mathematics, teacher related factors that affect pupils' academic performance in Mathematics and home related factors that affect pupils' academic.

CHAPTER THREE

METHODOLOGY

3.0 Overview

This section discusses the procedures and methods used to gather data for the study. The section is subdivided into the following sub-headings for discussion: Research design, study area, population of the study, sample size and sampling procedure, data collection procedure, data collection instrument, pilot testing of the instrument, validity of the instrument, reliability of the instrument, data collection procedures, data analyses procedure and ethical consideration.

3.1 Research Design

Mouton (2001) defined research design as a plan or blueprint of how one intends to conduct the research. It provides procedural outline for the conduct of any investigation. It, thus, reflects the plan that specifies how data relating to a given construct should be collected and analysed. For the purpose of this study, the descriptive survey design was used. According to Kulbir (2009), descriptive survey design is a research design that seeks to find factors associated with certain occurrences, outcomes, conditions or types of behaviours. The main purpose of descriptive survey is to observe, describe and document aspects of a situation as it naturally occurs. This design makes use of various data collection techniques such as pre-testing, questionnaire, observation, interviews, or examination of documents (Amedahe & Asamoah-Gyimah, 2003).

The design is seen as appropriate for the study because the nature of the topic requires that data is collected through self-report measures and large amounts of data can be collected within a short period of time. Also, a descriptive survey was adopted because the study sought to establish the views held by pupils and teachers on factors that affect

the performance of pupils in mathematics in the Effutu Municipalityity. Mugenda and Mugenda (2003) notes that survey research seeks to obtain information that describes existing phenomena by asking individuals about their attitude and behaviour. Robson (2011) asserts that descriptive survey design involves data collection in order to answer questions concerning the status of the subject of the study. The design was preferred for this study because of its appropriateness in educational fact-finding as it yields accurate information.

3.2 Study Area

The study was conducted in public junior high schools in the Effutu Municipalityity in the Central Region of Ghana to investigate factors that affect the performance of pupils in mathematics. The population of Effutu Municipalityity, according to the 2010 Population and Housing Census, is 68,592, which represent 3.1% of the region's total population of 2,201,863; with males and females representing 48.8% and 51.2% respectively (Ghana Statistical Service, 2014). The municipalityity is characterized by a youthful population since one-third of the population fall below the ages 15 years and in terms of occupation, majority of the populace (31.4%) are engaged in craft and related trades, followed by service and sales (24.9%); about 27% of the male population are into agriculture (Ghana Statistical Service, 2012).

Fishing is the most dominant industry in the Municipalityity, followed by retail services then agriculture and forestry. Effutu municipalityity is characterized by many educational institution and school. For instance University, Ghana Police Commander and Staff College, Nursing training college, Vocational institution and Senior high school. With this various educational institution, access to educational becomes easily. A third (33.8%) of the population with school going age are currently in primary school

with 13.3% at the Junior High School (JHS) level, less than one-tenth (6.9%) in the Senior High School (SHS) and close to 28% are at the tertiary level (Ghana Statistical Service, 2012). Effutu Municipalityity is divided into three circuits: the east, west and central circuits. The number of basic schools, both public and private, in the East, West and Central circuits is 39, 33 and 23 respectively (Effutu Municipality Education Directorate, 2017). The Figure 3.1 below shows a map of the study area.

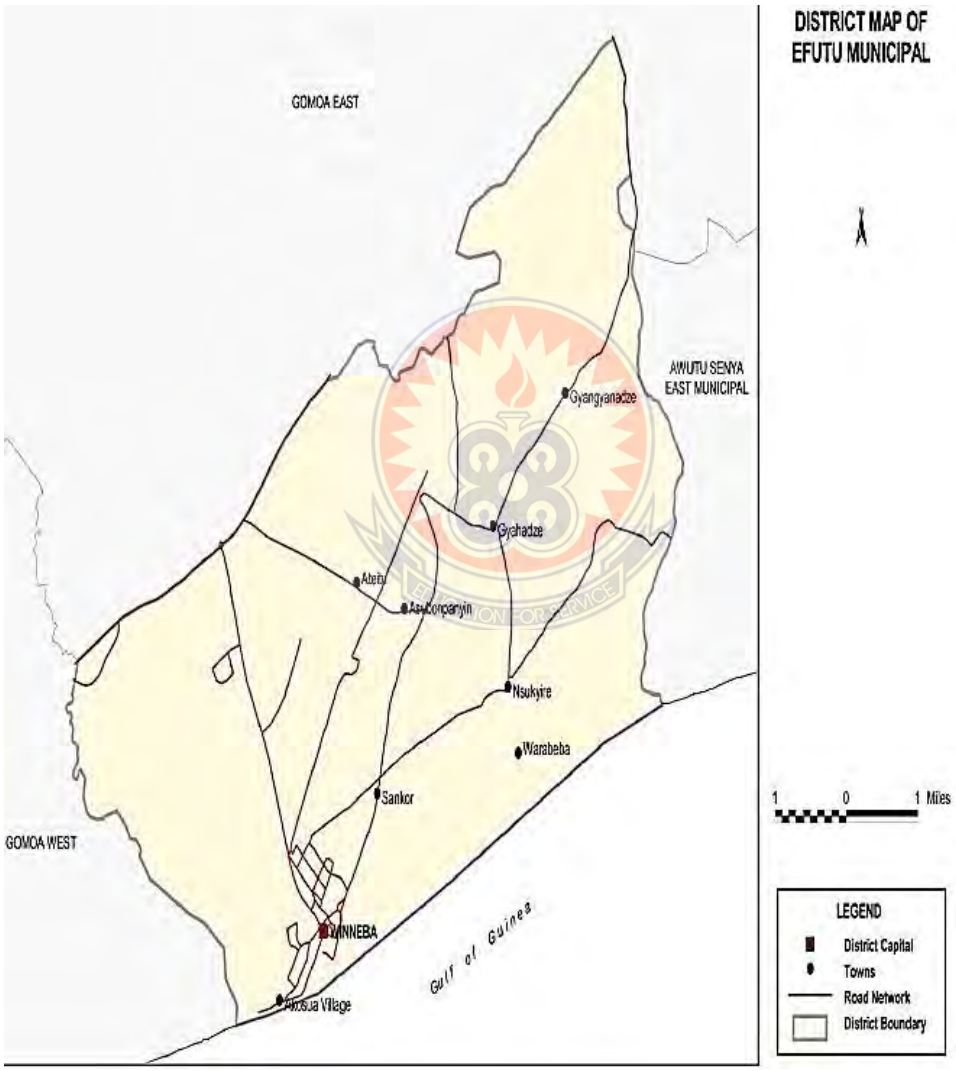

Fig 3.1: Map of the Study Area.

Source: Ghana Statistical Service, 2012

3.3 Population of the Study

When researchers decide on a phenomenon to measure, they consider whom and what to study. Who to study is often referred to as the population or sampling frame (Babbie, 2008). The target population for this study was all junior high school pupils and teachers' in public basic schools in the Effutu Municipalityity. The accessible population for this study was selected junior high school pupils and mathematics teachers' from 7 public basic schools in the Effutu Municipalityity. The researcher focused on the selected public school pupils and teachers in the basic school because they were within the researcher's reach.

3.4 Sample and Sampling Technique

According to Maduekwe (2011), a sample is a group selected from a population for observation in a study. It is a finite part of a statistical population whose properties are studied to gain information about the whole. Sampling techniques refer to the methods used to select sample from the target population. The process of selecting a portion of the population to represent the entire population is known as sampling (Polit & Hungler, 1999 cited in Badioo-Anu, 2017). The sample size for the study was one hundred and twenty (120) participants of which of one hundred and ten (110) were pupils and ten (10) were mathematics teachers

Multi-stage random sampling technique was used to select pupils and public junior high school for the study. Multistage sampling refers to sampling plans where the sampling is carried out in stages using smaller and smaller sampling units at each stage. In a two-stage sampling design, a sample of primary units is selected and then a sample of secondary units is selected within each primary unit (Burns & Grove 2001). Multi-stage sampling is a further development of the principle of cluster sampling (Kothari, 2004).

There are three year groups namely, JHS One, JHS Two and JHS Three. All the three year groups were considered for the study.

Stage 1

In the first stage, simple random sampling was used to select seven public Junior High Schools. This type of sampling is also known as chance sampling or probability sampling where each and every item in the population has an equal chance of inclusion in the sample and each one of the possible samples, in case of finite universe, has the same probability of being selected (Kothari, 2004). The lottery method was used. All the names of public Junior High Schools in the Municipalityity were written on pieces of paper. The pieces of paper were put into a container and rigorously shaken to enable seven schools to be selected by picking one piece at a time without replacement.

Stage 2

Proportionate random sampling was then used to select the number of pupils from the classes,thus JHS One 20 Pupils representing 18.2%, JHS Two 40 Student representing 36.3% and JHS Three 50 Pupils representing 45.5%. This is because I believed that pupils in JHS three were more knowledgeable about the factors responsible for poor academic performance than pupils in JHS Two and JHS One respectively. Simple random sampling technique was used because the reseearcher wanted to give each subject equal chances of being selected. The researcher believed that pupils in these classes had knowledge of BECE.

Again, the researcher used purposive sampling technique to select the mathematics teachers for the study. Purposive sampling technique was used because the resezrcher belived that these subjects could provide rich and accurate information for the study.

Also, the researcher used purposive sampling technique because it was less costly and free from bias.

3.5 Data Collection Instruments

Questionnaire and interview guides were used to collect data for the study.

3.5.1 Questionnaire

To Bulmer (2004), questionnaire is a very vital tool within social science research that basically collects information on participants' in view of matters relating to their social distinctiveness, present and past, standards of behaviour or attitudes, as well as beliefs and reasons for action with respect to the topic under investigation.

A structured questionnaire was designed for the junior high school pupils. The questionnaire was designed in two parts which consisted of 39 items. Part one for the Bio-data; this requires such details of the pupils as gender, age range and form of student. The second part was made up of four sections, namely; A, B, C and D. Section A which was made up of 9 items sought to elicit information on the perceived school-related factors that affect pupils' performance in mathematics. Section B was made up of 9 items which sought information on perceived student-related factors that affect pupils' performance in mathematics. Section C was made up of 9 items which sought information on perceived teacher-related factors that affect pupils' performance in mathematics Finally, Section D was made up of 9 items which sought information on perceived home-related factors that affect pupils' performance in mathematics. The questionnaire was constructed using a five-point Likert response scale. The justification of using a 5 point lickert scale was because, It provides accurate data about opinions on a certain topic, people can answer them quickly and it provides deeper details compared to binary choices.

3.5.2 Interview guide

Semi-structured interview guide were used to gather information from mathematics teachers. The interviews were conducted with the aim of following up a range of issues raised in the analysis of responses to the questionnaire instruments. In addition, this gave the researcher an opportunity to meet these people and seek more clarification on issues raised in the questionnaire. The interview questions were centred on the following themes: school related factors that affect pupils' performance in mathematics; student related factors that affect pupils' performance in mathematics; teacher related factors that affect pupils' performance in mathematics and home related factors that affect pupils' performance in mathematics. The interview was conducted on one-on-one basis in the school setting. This enabled the participants to express their views and concerns freely and explicitly.

3.6 Pilot Testing

According to Bell (2010), all data gathering instruments should be piloted to test how long it takes participants to complete them and to check that all questions and instructions are clear and to enable the researcher remove any items which do not yield usable data. A pilot study was planned and it was conducted before starting the collection of data. The pilot-testing helped to assess the validity and reliability of the research instrument. The pre-testing was used to detect and correct any errors that was identified in the instruments and could prevent it from eliciting the required responses. This helped the researcher to review and to restructure the questionnaire in order to obtain information that focuses on the research questions and to develop a deeper understanding of the situation to be studied. The pupils and teachers from the selected public junior high schools in Effutu Municipalityity were selected for the pilot testing of the instrument. The schools were selected for the pilot-test because of its proximity

and more importantly because of its characteristics to the study area. The pilot testing made it possible for the researcher to check the data analysis procedure. It again enabled the researcher to identify and correct research questions that were wrongly formulated, and could have given some unintended results.

3.7 Validity and Reliability of Research Instruments

The validity of the instrument was established using face and content means for the questionnaire whilst its reliability was established using the test-retest reliability method. Validity of the semi-structured questionnaire was established by following trustworthiness criteria established by Lincoln and Guba 1990 as cited in Alexander, 2019). According to Lincoln and Guba, the credibility of a research study is critical in determining its value. According to the data supplied by participants, trustworthiness relates to the assessment of the quality and worth of the whole study, as well as determining how closely the study findings follow the study's goals.

3.7.1 Validity of research instruments

According to Patton (2005), validity of a research instrument is how well it measures what it is intended to measure. To Orodho (2004) validity would be concerned with establishing whether the right questionnaire content is measuring what they were intended to measure. Face validity was established by giving the prepared instrument to the researcher's colleague pupils to check wrong spellings, omissions and grammatical mistakes. Observations from them on the instrument were effected before the instrument was administered on participants. Content validity in this study was determined with the help the researcher's supervisors.

The content validation was found appropriate in determining the extent to which the set of items provided relevant and representative sample of the domain of tasks under

consideration. The researcher ensured that data collected represented the content area under study. Comments from the supervisors were used to effect the necessary corrections. Validity of semi-structured interview items was ascertained through face validity. Like questionnaire items, this happened with the assistance of supervisors and departmental experts who through their consultation were able to tell the suitability of the questions in preparation for data collection.

3.7.2 Reliability of research instruments

Joppe (2000) defined reliability as the extent to which results are consistent over time. It implies that, if the results of a study can be reproduced under a similar methodology, then the research instrument of the study can be considered as being reliable. Reliability concerns with the degree to which an experiment, test or any measuring procedure yields the same results on repeated trials (Patton, 2007). Test-retest method of reliability was employed and the questionnaire was administered twice to the same group, with a time span of one month. Reliability coefficient values of 0.87 and 0.89 were respectively obtained. This indicates that the results were consistent thus ensuring the reliability of the research instrument. For the semi-structured interview questions, reliability was ascertained by interviewing the interviewees himself adhering to the same format and being consistent in asking same questions to different respondents.

3.8 Data Collection Procedure

In conducting a study, Creswell (2005) advises researchers to seek and obtain permission from the authorities in charge of the site of the study because it involves a prolonged and extensive data collection. In line with this, a letter of introduction was collected from the Head of the Department of Basic Education, University of Education, Winneba, stating the aim and purpose of the study and the need for the

participants to give their consent and co-operation. A copy of the letter was given to the heads of the selected public junior high schools and permission was granted for the questionnaires to be administered. The researcher emphasized that the participants should not write their names or the names of their various schools when responding to the questionnaire. This was done to cater for anonymity.

The researcher personally administered the questionnaires to the participants. After the explanation of the questionnaire by the researcher, the participants were later allowed to independently give their responses to the items with little supervision by the researcher. About thirty (30) minutes was allowed for the respondents in each case to answer the questions. The researcher went round to collect the work immediately the time given had elapsed. The researcher adopted this approach to eliminate adulterated responses of participants. The questionnaire was administered on the same day and collected on the same day after the stipulated time. The researcher used a semi-structured interview guide to gain an in-depth understanding of the junior high schools teachers' views on factors that affect pupils' performance in mathematics. It was a one-on-one interview. The proceeding of the interview was audio-taped and transcribed subsequently and also with a field notes.

3.9 Data Analyses Procedure

Data analysis is the practice of extracting useful information from raw data. Data analysis is the process of organising the data collected for example into categories (Kothari, 2008). Data analysis is important for interpreting these raw data, in order to obtain the meaning and pattern from data (Bell, 2005). In analyzing the data, the data was categorized under themes with respect to the research questions. Editing and coding was done, after which, the data was entered into the computer using the

statistical package for social science software (SPSS) version 20. Before performing the desired data transformation, the data was cleaned by running consistency checks on every variable. Corrections were made after verification from the questionnaires and the database was generated. The data was presented using descriptive statistics involving mainly frequency distribution tables and percentages.

Specifically, the demographic characteristics of the respondents was analysed using frequencies and percentages. Also, research questions were analysed using means and standard deviations. These were done with the use of computer software called Statistical Product for Service Solutions (SPSS) version 21.

3.10 Ethical Consideration

During the study, the following ethical issues were considered.

Voluntary Participation: Voluntary participation means that participants were never forced to take part in the study. Participants were informed that participation in the study was completely voluntary and that they could withdraw from the study at any time without prejudice.

Informed Consent:. The researcher ensured that participants had access to relevant information prior to signing the consent form. The participants were asked to sign consent forms for the interview and for tape recording of the interview.

No Harm to the Participants: The researcher ensured that there was no harm to participants by clearly explaining what would be involved in this study. The researcher also guarded against asking questions that could embarrass or endanger the participants.

Anonymity and Confidentiality: Participants were assured of confidentiality and anonymity. Participants were informed that only the researcher and his supervisor

would have access to the recordings and the transcripts. Anonymity was ensured so that participants cannot be identified with the responses. The researcher used pseudonyms instead of the participants real names. The participants were also informed that neither their names nor their departments' would be mentioned in the research report.

Deception: The researcher ensured that all participants were aware that the research was conducted as part of his academic studies. The participants were provided with the researcher' and his supervisor's contact details in the eventuality that they needed more clarity or information regarding the study.

Ethics Clearance: The researcher obtained the Ethics clearance from the said department in University of Education, Winneba (North-Campus). The proposal for this study was also approved by the Department of Basic Education. The researcher ensured that he conduct the study in an ethical manner.

3.10 Chapter Summary

In this Chapter,we have discussesd the research design,study area,,population and sample of the study.We have also discussed the data collection instruments, the pilot study, validity and reliability.

In addition, we have outline the data collection procedure,data analyses procedure and ethical considerations.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Overview

This chapter presents the analysis and discussion of data collected for the study. The data collected was structured into four (4) main sections. The first section focused on the Demographic characteristics of the respondents, the second section deals with the data analysis, discussion of findings in relation to the research questions was the third section and the fourth section deals with the summary of findings. Questionnaires were administered to one hundred and ten (110) pupils whiles interview guide was used to elicit views of the mathematics teachers in the selected junior high schools in the Effutu Municipalityity. All questionnaires were duly filled and returned.

4.1 Demographic Characteristics of Pupils

Here, the pupils were asked to indicate their gender, age range, level of class, parental marital status, living statuses and educational level of pupils' guardian. The results are presented in Table 4.1 to 4.6.

4.1.1 Gender of pupils

The first item on the questionnaire sought to find out the gender of pupils. The result is presented in Table 4.1.

Table 4.1: Gender Distribution of Pupils

Sex	Frequency	Percentage
Male	60	54.5%
Female	50	45.5%
Total	**110**	**100%**

Source: Field Data (2020)

Results from Table 4.1 indicate that 60 (54.5%) of participants who took part in the study were males while 50 (45.5%) were females. This means that more males participated in the study than females.

4.1.2 Age of pupils

Item 2 of the questionnaire sought to find out the age of the pupils. The result is presented in Table 4.2.

Table 4.2: Age Distribution of Pupils

Age Range	Number of pupils	Percentage (%)
11 – 15 years	25	22.7%
16 – 20 years	75	68.2%
20 years and above	10	9.1%
Total	**110**	**100%**

Source: Field Data (2020)

Table 4.2 shows the age groups of the pupils. The dominant age group of the pupils ranged between 16 – 20 years representing 68.2%, followed by age group between 11 to 15 years representing 22.7% whereas ages more than 20 years made up the smallest group, representing 9.1% of the pupils.

4.1.3 Class level of pupils

Item 3 of the questionnaire sought to find out the level of class of pupils. The results are presented in Table 4.3

Table 4.3: Class Distribution of Pupils

Class Level	Frequency	Percentage (%)
JHS 1	20	18.2%
JHS 2	50	45.5%
JHS 3	40	36.3%
Total	110	100%

Source: Field Data (2020)

Table 4.3 shows that out of 110 pupils, 20 of the pupils representing 18.2% were in JHS 1, 50 of the pupils representing 45.5% were in JHS 2 and 40 of the pupils representing 36.3% were in JHS 3. The results indicate that majority of the pupils were in JHS 2.

4.1.4 Parental marital status

Item 4 of the questionnaire sought to find out the parental marital status of pupils. The results are presented in Table 4.4.

Table 4.4: Distribution of Pupils Parental Martial Status

Parental Martial Status	Frequency	Percentage (%)
Single	35	31.8%
Married	75	68.2%
Total	110	100%

Source: Field Data (2020)

Concerning the pupils' parents' marital status, Table 4.4 shows that 35 of the pupils representing 31.8% parents were single; whiles 75 of the pupils representing 68.2% parents were married.

4.1.5 Living standards of pupils

Item 5 of the questionnaire sought to find out the living status of pupils. The results are presented in Table 4.5.

Table 4.5: Distribution of Pupils Living Standards

Living Status	Frequency	Percentage (%)
Mother only	18	16.4%
Father only	12	10.9%
Both parents	75	68.2%
Other relatives	5	4.5%
Total	110	100%

Source: Field Data (2020)

With regard to the pupils' living status, Table 4.5 shows that 18 of the pupils representing 16.4% stayed with their mothers only, 12 of the pupils representing 10.9% stayed with their fathers only, 75 of the pupils representing 68.2% stayed with both of their parents, whiles 5 of the pupils representing 4.5% stayed with other relatives.

4.1.6 Parents/Guardian of pupil's educational level

Item 6 of the questionnaire sought to find out the living status of pupils. The result is presented in Table 4.6

Table 4.6: Distribution of Pupils Parents/Guardian Educational Level

Educational Level	Frequency	Percentage (%)
Tertiary	9	8.1%
Secondary	29	26.4%
Basic	39	35.5%
Uneducated	33	30.0%
Total	110	100%

Source: Field Data (2020)

In terms of the pupils' parents or guardians' education status, Table 4.6 indicates that 9 of the pupils representing 8.1% had graduate parents, 29 of them representing 26.4% had secondary education status parents, 39 of them representing 35.5% had basic education level parents whiles 33 of them representing 30.0% had uneducated parents.

4.2 Results

Research Question One: What are the school-related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipalityity?

This question was posed to determine school related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipalityity. The results are presented in Table 4.7.

Table 4.7: School-Related Factors That Affect the Performance of Pupils in Mathematics

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	5.485	1.235		4.442	0
Lack of quality physical facilities in schools	2.522	0.34	0.154	7.417647	0.001
Limited number of Mathematics reading materials and other	0.99	0.36	0.275	2.75	0.003485
Large class sizes	0.25	0.44	0.056818	0.568182	0.285562
Poor classroom learning environment	0.54	0.63	0.085714	0.857143	0.196627
Limited number of Mathematics teaching and learning materials (TLMs)	0.34	0.55	0.061818	0.618182	0 .268894
High teacher-Student Ratio	0.41	0.35	0.117143	1.171429	0.121985
Limited use of instructional materials in Mathematics	-0.52	0.296	-0.17568	-1.75676	0.040936
Inadequate supervision	-0.35	0.456	-0.07675	-0.76754	0.121985
Poor school environment	-1.995	0.373	-0.238	-5.34853	0.00001

R^2=0.66 (N=110, p < 0.05)

a. Dependent Variable: Academic Performance

Results in Table 4.7 show the pupils' views on school related factors that affect their performances in mathematics in junior high schools in the study area. An inspection of individual predictors revealed that Lack of quality physical facilities in schools (Beta = 0.154, $p < 0.05$), Limited number of Mathematics reading materials and other (Beta= 0.99, $p < 0.05$), Limited use of instructional materials in Mathematics (Beta= -0.52, $p < 0.05$), and Poor school environment (Beta= -1.995, $p < 0.05$), are significant predictors of overall Academic Achievement.

Research Question Two: What are the student-related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipalityity?

This question was posted to identify student related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipalityity. The results are presented in Table 4.8.

Table 4.8: Student-Related Factors That Affect the Performance of Pupils in Mathematics

Model	Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	4.485	1.235		3.631579	0
Poor attitude of pupils towards mathematics	0.33	0.64	0.154	0.515625	0.303584
Lack of commitment on the part of pupils	0.99	1.56	0.063462	0.634615	0.263503
Low academic ambition	0.25	0.44	0.056818	0.568182	0.285562
Pupils' poor learning styles of Mathematics	1.54	0.63	0.244444	2.444444	0.008049
Pupils' lack of motivation for studying Mathematics	1.12	0.55	0.203636	2.036364	0.022061
Pupils lack of self-confidence	1.21	0.35	0.345714	3.457143	0 .000389
Inadequate effort towards Mathematics	-0.52	1.296	-0.04012	-0.40123	0.344599
Pupils' low self-concept	-0.24	0.456	-0.05263	-0.52632	0.121985
Lack of interest in Mathematics studies	-2.495	0.373	-0.238	-6.68901	0.00001

R^2=0.66 (N=110, p < 0.05)
a. Dependent Variable: Academic Performance

Results in Table 4.8 revealed pupils' views on student related factors that affect their performances in mathematics in junior high schools in the study area. An inspection of individual predictors revealed that Pupils' poor learning styles of Mathematics (Beta = 1.54, $p < 0.05$), Pupils' lack of motivation for studying Mathematics (Beta = 1.12, $p < 0.05$), Pupils lack of self-confidence (Beta = 1.21, $p < 0.05$), and Lack of interest in

Mathematics studies (Beta = -2.495, $p < 0.05$), significant predictor overall Academic Achievement.

Research Question Three: What teacher related factors affect pupils' performance in mathematics among junior high schools in the Effutu Municipalityity?

This question sought to establish teacher related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipality. The results are presented in Table 4.9.

Table 4.9: Teacher-Related Factors That Affect the Performance of Pupils in Mathematics

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	4.485	1.235		3.631579	0
Inadequacy of professional teachers	0.24	0.64	0.154	0.375	0.354191
Teacher incompetence	0.25	1.56	0.016026	0.160256	0.436509
Lack of mentorship for teachers	0.12	0.44	0.027273	0.272727	0.392798
Inadequate teaching experience	0.29	0.63	0.046032	0.460317	0.323105
Low level of teacher qualification	0.21	0.55	0.038182	0.381818	0.351673
Methods and techniques of teaching Mathematics	0.51	0.35	0.145714	1.457143	0.073969.
Teacher impatience for slow learners	-0.42	1.296	-0.03241	-0.32407	.373277.
Lateness to school	-0.98	0.456	-0.21491	-2.14912	0.016913.
Poor attitude towards learners	-0.423	0.373	-0.238	-1.13405	12963

R^2=0.66 (N=110, p < 0.05)
a. Dependent Variable: Academic Performance

Results in Table 4.9 revealed pupils' views on teacher- related factors that affect their performances in mathematics in junior high schools in the study area. An inspection of individual predictors revealed that Methods and techniques of teaching Mathematics

(Beta = 0.51, $p < 0.05$), and Lateness to school (Beta = -0.98, $p < 0.05$) significant predictor overall Academic Achievement.

Research Question Four: What are the home related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipalityity?

This question sought to examine home related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipality. The result is presented in Table 4.10.

Table 4.10: Home-Related Factors That Affect the Performance of Pupils in Mathematics

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	4.485	1.235		3.6315789	0
Parent's level of education	0.32	0.64	0.154	0.5	0.309037
Parent's occupation	2.44	0.56	0.435714286	4.3571428	0.000015
Parent's income	1.34	0.44	0.304545455	3.0454545	0.001454
Family backgrounds	1.35	0.63	0.214285714	2.1428571	0.017167
Nutrition and health status	2.34	0.55	0.425454545	4.2545454	0.000022
Large family size	1.15	0.35	0.328571429	3.2857142	0.000683
Parental involvement in academic work	2.15	1.296	0.165895062	1.6589506	0.049992
Inadequate supervision	1.63	0.456	0.35745614	3.5745614	0.000261
Broken homes	1.52	0.373	-0.238	4.0750670	.000044.

R^2=0.66 (N=110, $p < 0.05$)
a. Dependent Variable: Academic Performance

Results in Table 4.10 revealed pupils' views on home related factors that affect their performances in mathematics in junior high schools in the study area. An inspection of individual predictors revealed that in exception of Parent's level of education (Beta =

0.32, $p > 0.05$) all other variables – Parent's occupation (Beta = 2.44, $p < 0.05$), Parent's income (Beta = 1.34, $p < 0.05$), Family backgrounds (Beta = 1.35, $p < 0.05$), Nutrition and health status (Beta = 2.34, $p < 0.05$), Large family size(Beta = 1.15, $p < 0.05$), Parental involvement in academic work (Beta = 2.15, $p < 0.05$), Inadequate supervision (Beta = 1.63, $p < 0.05$), and Parental involvement in academic work (Beta = 1.52, $p < 0.05$) significant predictor of overall Academic Achievement.

4.3 Interview Data Results

The aim of this section was to use semi-structured interview to collect qualitative data to help explain in greater depth the key issues that emerged from the quantitative phase of this study. The interview was conducted on ten junior high school mathematics teachers. The following were themes around which the qualitative data (interview) was collected.

4.3.1 School-related factors that affect the performance of pupils in mathematics

Many school learning environment affect the performance of student in mathematics. During the interview, the interviewer first asked the interviewees whether limited use of instructional materials in mathematics affect pupils' performance in mathematics. In fact most of the mathematics teachers who participated in this study share this view that limited use of instructional materials in mathematics affect pupils' performance in mathematics. This is how the mathematics teachers interviewed put it:

Mathematics Teacher One:

Pupils usually perform better in mathematics when they have instructional materials in mathematics.

Mathematics Teacher Two:

When instructional materials are limited, the effectiveness of the lesson delivery is affected thus impede the progress of the pupils' performances in mathematics.

Mathematics Teacher Three:

Adequate instructional materials motivate pupils and encourage them to study mathematics lesson. So, if the instructional materials are limited it can affect their performance in mathematics.

Mathematics Teacher Four:

With adequate use of instructional materials there is effective teacher-student hands-on activities during mathematics lessons which helps pupils to improve their performance in mathematics.

Mathematics Teacher Five:

The limited use of instructional materials in mathematics hinders pupils' progress in mathematics. That's why we normally have pupils performing poorly in mathematics in BECE.

Mathematics Teacher Six:

The limited use of instructional materials in mathematics is a major challenges to us the teachers. The school is providing likewise the parents, so pupils tend to suffer in learning mathematics.

Mathematics Teacher Seven:

> *There is a saying that, 'practice makes man perfect'. So when the instructional materials are limited how we can the teachers practice with pupils for them to understand the lesson. Hence, affect their performance in mathematics.*

Mathematics Teacher Eight:

> *Just imagine, delivering mathematics lessons without instructional materials. Is like going to the farm without a cutlass. Thus, pupils' performance in mathematics will be affected when the instructional materials are limited.*

Mathematics Teacher Nine:

> *When there is adequate instructional materials pupils are expose to varieties of information which helps student to understand the content of the lesson.*

Mathematics Teacher Ten:

> *Finally, the GES should provide adequate instructional materials for materials teachers in order to have smooth and effective lesson delivery in mathematics.*

Mathematics teachers views on whether limited instructional in mathematics affect pupils' performance in mathematics shows that, pupils perform better when they provided with adequate instructional materials but if instructional materials are limited, it will affect pupils performance in mathematics. Hence, the limited use of instructional materials affect pupils performance in mathematics.

The responses of Mathematics Teachers 1,3,4,6, and 9 confirms what Akkoyunlu (2002) said, that instructional materials motivate pupils, and encourage them to study lesson providing them with opportunity to have an access to information and to evaluate

it. Also, Mathematics Teachers 2,5,7 and 10 responses show that instructional materials in mathematics affect the performance of pupils in mathematics. Their responses are in line with Etsey (2005) assertion that the shortage of teaching-learning materials such as maps, atlases, charts and magazines makes it difficult for pupils to understand the lessons and this leads to low performance because it tends to reduce the effectiveness of teaching. Lack of textbooks implies that pupils are not able to do a lot of exercises which in turn make them receive little or no attention and feedback to enhance their gained knowledge and improve their academic performance.

Again, the researcher asked the mathematics teachers whether large class size affect pupils' performance in mathematics. The following are the responses mathematics teachers gave:

Mathematics Teacher One:

> *Large class size is unconducive for serious academic work. This affect the progress of pupils learning mathematics.*

Mathematics Teacher Two:

> *Owning to the bloated class-size, the teaching of mathematics lessons becomes unwieldy and tedious thus hinder effective monitoring of pupils performance in mathematics.*

Mathematics Teacher Three:

> *Due to large class size, personal attention to individual pupils becomes impracticable.*

Mathematics Teacher Four:

> *Large class size makes marking of assignments becomes tedious and burdensome. Also, the compilation of results became a frustrating*

exercise. The resultant effect is the pathetic situation of poor performances in Mathematics examination.

Mathematics Teacher Five:

It is very difficult to deliver effectively in a large class size which affect pupils' performance in mathematics.

Mathematics Teacher Six:

We know that effective teaching is best done in classes with smaller numbers that allow for personal attention thus, a large class size does not promote effective teaching of the mathematics lesson.

Mathematics Teacher Seven:

Large class size are usually associated with difficulties such crowding of class, poor sitting arrangements and pupils feeling uneasy and less motivated.

Mathematics Teacher Eight:

Large classes encourage rote learning which is not helping us the mathematics teachers in lesson delivery.

Mathematics Teacher Nine:

Large class size really affect pupils' performance in mathematics. Thus, the GES should provide enough classroom to accommodate pupils.

Mathematics Teacher Ten:

Finally, pupils problem solving skills are not encouraged when the size of the class are large and that affect pupils' performance in mathematics.

Mathematics teachers views on whether large class size affect pupils' performance in mathematics shows that large class size is unconducive for serious academic work, thus affect the progress of pupils learning in mathematics. Therefore, it is important for the GES to provide enough classroom to accommodate pupils.

The responses show that larger class size affects pupils' performance in mathematics. In support of the effect of class size on academic performance in mathematics, Reutzel& Cooter (2010) added that, since children have differences in drive, interests, and abilities and that they also differ in health, personal and social adjustment, and creativity, generally teaching is best done in classes with smaller numbers that allow for personal attention. Similarly, Psacharopoulos & Woodhall (1985) cited in Adane (2013) pointed out that teachers in large classes tend to focus more on rote learning, rather than on problem solving skills.

4.3.2 Student-related factors that affect the performance of pupils in mathematics

Student's related factor is one of the important aspects of high fail rate in mathematics plays vital role in a teaching learning process. During the interview, the researcher asked the mathematics teachers whether poor attitude of pupils towards mathematics affect the performance of pupils in mathematics. The following are the mathematics teachers responses:

Mathematics Teacher One:

> *If pupils exhibit poor attitude towards mathematics definitely the student will not perform well in mathematics.*

Mathematics Teacher Two:

The general relationship between attitude and mathematics achievement is based on the concept that the better the attitude a student has towards mathematics task, the higher the achievement or performance level in mathematics.

Mathematics Teacher Three:

If the attitude of the student towards mathematics is poor or not encouraging then the student output will be affected greatly.

Mathematics Teacher Four:

Student poor attitude toward mathematics can prevent the student not to attend mathematics class which affect the student performance in mathematics.

Mathematics Teacher Five:

Pupils poor attitude such as absenteeism, truancy, indiscipline affect pupils' performance in mathematics.

Mathematics Teacher Six:

Any time there is poor attitude of pupils towards mathematics definitely the student will not be interested to learn mathematics which will affect the performance.

Mathematics Teacher Seven:

The poor attitude of pupils towards mathematics depends on gender. I think male pupils show good attitude towards mathematics than the female pupils. Thus, majority of the female pupils perform poorly in mathematics.

Mathematics Teacher Eight:

> *For a student to exhibit a poor attitude towards mathematics then many factors has call for that. Thus, we the teachers should assist pupils develop positive attitude mathematics.*

Mathematics Teacher Nine:

> *Poor attitude such truancy and incompetence in mathematics of pupils reduces the efficiency in their academic works.*

Mathematics Teacher Ten:

> *Mostly is female pupils who show poor attitude of pupils towards mathematics. I think we the teachers must have enough time for the female pupils in order to excel in mathematics.*

Mathematics teachers views on whether poor attitude of pupils towards mathematics affect the performance of pupils in mathematics indicates that, pupils poor attitude towards mathematics can prevent them not to attend mathematics class that is absenteeism and truancy which affect student performance in mathematics. Also, the poor attitude of pupils towards mathematics can be on gender bases. Hence, mathematics teachers should assist pupils develop positive attitude towards mathematics.

The response of Mathematics Teacher 7 and 10 support the findings of Michelli (2013) who found that, men had a more positive attitude towards mathematics than their respective women did, but in the performance test, gender did not differ in the assessment. Also, Jolibongo (2012) posits that if a student has a positive attitude towards mathematics, he will not only enjoy studying it but will also derive satisfaction from the knowledge of mathematical ideas he gains. Jolibongo (2012) explains further, if a student has a positive attitude to mathematics, he will definitely be interested in its

teaching and learning. Thus, Michelli (2013) extremely wake call on especially educators on how they ought to be in knowing of pupils' attitude and the need to improve on them to influence their performances positively.

Moreover, the researcher asked the mathematics teachers whether lack of motivation for studying mathematics affect the performance of pupils in mathematics. The following are the mathematics teachers responses:

Mathematics Teacher One:

> *When a student is strongly motivated all his or her effort and attention are directed toward the achievement of mathematics tasks which helps the student to perform well in mathematics.*

Mathematics Teacher Two:

> *When a student lack motivation for studying mathematics, the zeal for solving mathematical tasks will be affected which will result in poor performance in mathematics.*

Mathematics Teacher Three:

> *Just imagine 'a car without fuel', can you start the car? Thus, when pupils lack motivation in studying mathematics definitely their performance will be affected in mathematics.*

Mathematics Teacher Four:

> *Lack of motivation can lead to low self-esteem when the student is performing mathematical tasks which the student performance in mathematics.*

Mathematics Teacher Five:

> *Lack of motivation for studying mathematics affect the performance of pupils in mathematics, thus teachers and parents should motivate pupils to learn mathematics.*

Mathematics Teacher Six:

> *Motivation stimulate the desirable behaviour of pupils. So, if pupils lack motivation then there will not be any stimulation in their behaviour which can affect their performance in studying mathematics.*

Mathematics Teacher Seven:

> *Pupils who lack motivation for studying mathematics normally do not perform well in mathematics.*

Mathematics Teacher Eight:.

> *Lack of motivation can also lead to low self-confidence which can affect the performance of student in mathematics.*

Mathematics Teacher Nine:

> *Lack of motivation impede pupils' progress in learning mathematics.*

Mathematics Teacher Ten:

> *Finally, there is a certain perception that mathematics is a difficult subject to study, so if there is a lack of motivation for studying mathematics then student performance in mathematics will be affected.*

Mathematics teachers views on whether lack of motivation for studying mathematics affect the performance of pupils in mathematics indicates that, when pupils are motivated their effort, zeal and attention are directed towards the achievement of mathematics tasks which helps them to perform well in mathematics meanwhile if pupils lack motivation, it impede their progress in learning mathematics thus affect their

performance in mathematics. Hence, teachers and parents should motivate pupils to learn mathematics.

In this regard Asubel's theory argues that pupils should be motivated to learn mathematics in meaningful way. Supporting this view Acharya (2017) claims that the role of a teacher is to mentor and the role of a student is active participation in teaching process, the mathematics learning become meaningful. Poorly motivated pupils may not learn mathematics. So pupils did not pass in mathematics due to lack of motivation (Acharya, 2017).

4.3.3 Teacher-related factors that affect the performance of pupils in mathematics

Teacher related factor have significant influence on pupils' academic performance in mathematics. During the interview, the researcher asked the mathematics teachers whether low level of teacher qualification affect the performance of pupils in mathematics. The following are the mathematics teachers responses:

Mathematics Teacher One:

> *Teacher qualification has impact on pupils' academic performance in mathematics.*

Mathematics Teacher Two:

> *A teacher who lacks the professional skill will be unable to deliver in class, which will induce poor pupils' performance in mathematics.*

Mathematics Teacher Three:

> *There is a saying that, he who knows, knows how to impart or share. So if one is not qualified to teach especially mathematics subject, how can he impart. Thus, this will affect student performance in mathematics.*

Mathematics Teacher Four:

Low level of teacher qualification affects the performance of pupils in mathematics. Thus the GES should be mindful of how teachers are being trusted with certain subject to teach.

Mathematics Teacher Five:

I think low level of teacher qualification with low level of experience in teaching mathematics really affect student performance in mathematics.

Mathematics Teacher Six:

The content delivery of the mathematics lesson is ineffective when there is low level of teacher qualification which affect student performance in mathematics.

Mathematics Teacher Seven:

Due low level of teacher qualification, most teachers finds it difficult to deliver the mathematics lesson well which affect student performance in mathematics.

Mathematics Teacher Eight:

A teacher may high level of qualification but when he works under unfavourable condition of service, he would be less dedicated to his or her work and be less productive which will affect student performance in mathematics.

Mathematics Teacher Nine:

Teachers should encourage to upgrade themselves in order to help student perform well in mathematics.

Mathematics Teacher Ten:

> *If the qualification of the teacher is low then teaching and learning mathematics will be very difficult for pupils and teachers which will affect pupils understanding in mathematics lesson which result in poor performance in mathematics.*

Mathematics teachers views on whether low level of teacher qualification affect the performance of pupils in mathematics indicates that, low level of teacher qualification affects the performance of pupils. Thus, teachers should be encourage to upgrade themselves in order to help student perform well in mathematics.

The responses indicate that, low level of teacher qualification affect pupils' performance in mathematics. Etsey, Amedahe & Edjah (2005) pointed out that a teacher who does not have both the academic and the professional qualifications would undoubtedly have a negative influence on the teaching and learning of a given subject.

Moreover, the researcher asked the mathematics teachers whether methods and techniques of teaching mathematics affect the performance of pupils' in mathematics.

Mathematics Teacher One:

> *The methods and techniques we use to teach mathematics affect the performance of pupils' in mathematics. Hence, heads and other education stakeholders should provide in-service training for mathematics teachers.*

Mathematics Teacher Two:

> *For us to help student improve upon their performance in mathematics, we must be mindful of the kind of methods and techniques we use in lesson delivery.*

Mathematics Teacher Three:

When methods and techniques are employed effectively there will be tremendous improvement in pupils' performance and vice versa.

Mathematics Teacher Four:

For student to perform well in mathematics lesson, we the teachers must know each student in the class and know the kind of method and technique to apply while teaching.

Mathematics Teacher Five:

We often say that a bad driver usually damage cars whether new/old. Likewise when teachers implement bad methods and techniques, it really affect student performance in mathematics.

Mathematics Teacher Six:

For pupils to perform well in mathematics us the teachers must know the kind of methods and techniques which will suitable for the pupils.

Mathematics Teacher Seven:

When methods and techniques are employed effectively there is always improvement in pupils' performance in mathematics but when methods and techniques are employed ineffectively there is always decline in pupils performance in learning mathematics.

Mathematics Teacher Eight:

If he who fail to plan, plan to fail. This implies that, every teacher must have an effective way to execute his or her lesson only if he or she has planned well.

Mathematics Teacher Nine:

> *When methods and techniques are employed effectively there will be tremendous improvement in pupils' performance and vice versa.*

Mathematics Teacher Ten:

> *Finally, there are various techniques and methods of teaching mathematics. Every teacher uses his/her specific way of presenting a lesson. That is why many scholars argue that there are as many methods of teaching as there are teachers. On the other hand, there is no one best or most effective method in teaching mathematics.*

Mathematics teachers views on whether methods and techniques of teaching mathematics affect the performance of pupils' in mathematics indicates that, although there are various methods and techniques of teaching mathematics but when mathematics teachers fail to plan, then they plan to fail. This affect student performance in mathematics because teachers do not employ effective methods and techniques in their lesson delivery. Hence, heads and other education stakeholders should provide in-service training for mathematics teachers.

The responses support Pryor and Ampiah (2003) who found out that most children are unable to follow the main 'text' of school lessons, which constructed by the teacher assisted by one or two higher achieving pupils and by ritual responses from the rest of the class.

4.3.4 Home-related factors that affect the performance of pupils in mathematics

Home related factor have influence on pupils' academic performance in mathematics. During the interview, the researcher asked the mathematics teachers whether broken homes affect the performance of pupils in mathematics. The following are the responses mathematics teachers gave:

Mathematics Teacher One:

Broken homes really affect the academic performance of student in mathematics.

Mathematics Teacher Two:

Most often pupils from broken homes are financially challenged and this does not augur well for effective academic performance and achievement of pupils.

Mathematics Teacher Three:

Broken homes result in single parenting and this most of the time is not good for the student wellbeing.

Mathematics Teacher Four:

The attention of the student is divided in broke homes and this do not help the student to perform well academically especially in mathematics.

Mathematics Teacher Five:

Broken homes normally leads to school drop-out.

Mathematics Teacher Six:

Broken homes affect the performance of pupils in mathematics because such family finds it difficult to buy the needed mathematics materials for the pupils.

Mathematics Teacher Seven:

I am a victim of a broken home and it was a woeful experience. It really affect the performance of the student.

Mathematics Teacher Eight:

Broken homes affect the performance of student and we the teachers can help the student in such situation to perform well in mathematics.

Mathematics Teacher Nine:

> *From my experience, broken homes don't really affect pupils' performance in mathematics. I was raise by mother when my father divorce my mother. She was discipline and she guided me strictly to climb the academic ladder.*

Mathematics Teacher Ten:

> *Finally, broken homes affect student performance in mathematics only on a condition when the single parent cannot afford the learning materials for the student.*

Mathematics teachers views on whether broken homes affect the performance of pupils in mathematics indicates that, most often pupils from brokens are financially challenged and this does not augur well for effective academic performance and achievement of pupils. Thus, teachers and other stakeholders can help pupils in such situations to perform well in mathematics.

With these responses, Uwaifo (2008) pointed out that, these conditions (broken homes) are not conducive for effective parenting in order to influence the positive influence of children's education. This is because when the single parent is overloaded by responsibilities and by their own emotional reaction to their situation; they are most often overwhelmed by such conditions thereby making them to become bad-tempered, intolerant and insensitive towards their children's educational needs. Such conditions do not provide a conducive environment for academic excellence. Thus, broken homes affect pupils' performance in mathematics.

Again, the researcher asked the mathematics teachers whether parent level of education affect pupils' performance in mathematics. The following are the responses mathematics teachers gave:

Mathematics Teacher One:

> *The level of parents' education can affect the achievement drive of their children in their academic endeavours.*

Mathematics Teacher Two:

> *It is very possible that educated parents provide adequate learning materials for their children which helps them perform well academically.*

Mathematics Teacher Three:

> *Educated parents stimulate their children to learn and perform better in all subjects.*

Mathematics Teacher Four:

> *The level of parent education can help parent coach their children to perform well in mathematics.*

Mathematics Teacher Five:

> *Sometimes pupils' performance in mathematics are affected when the parent has a low level of education.*

Mathematics Teacher Six:

> *Low level of parent education affect pupils; performance in mathematics in the sense that, if the parent do not know the value of education they will not encourage their wards to participate fully in school activities hence affect their performance.*

Mathematics Teacher Seven:

> *I will agure from the genetic aspects. If some parent hate mathematics or do not show much insterest in mathematics, the possible of their wards also showing disinterest in mathematics is very high. Hence, affect their watds performance in mathematics.*

Mathematics Teacher Eight:

> *At times, some parent naturally dislike mathematics and do not find means and ways to help their wards or motivate their wards to do well in mathematics.*

Mathematics Teacher Nine:

> *Pupils' performance in mathematics are affected when the parent has a low level of education.*

Mathematics Teacher Ten:

> *Finally, the level of education of parents is the degree to which parents have acquired some knowledge, skills, attitudes and values of informal and formal education. These parents are concerned over their children's education/performance, which sometimes makes them appoint part-time teachers for them. So, parent level of education affect pupils' performance in mathematics.*

Mathematics teachers views on whether parent level of education affect pupils' performance in mathematics indicates that, the level of education of parents is the degree to which parents have acquired some knowledge, skills, attitudes and values of

informal and formal education. So, if parent level of education is low; it means that parents lack these knowledge, skills, attitude and values obtained from the formal and informal education. Thus, these parents would not be in the best position to help their wards to perform well in mathematics.

These responses affirms what McKeachie (2009) found, that parental level of education influences academic performance of their wards. This means that parents with less or no education are likely to have their wards performing poorly academically owing to the fact that, their status in society might not permit them to contribute positively to the academic performance of the pupils.

4.4 Discussion of Findings

This section discusses data gathered from the data analysis in an attempt to answer the stated research questions. The discussion was done in line with the literature review in the study and in line with other findings that have a link with the stated research objectives and questions. However, strong agreed and agreed were merged into agreed while strongly disagreed and disagreed were merged into disagreed.

What are the school related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipality?

The first research objective seeks to determine school related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipality. The study found that that limited use of instructional materials in mathematics affect pupils' performance in mathematics. This findings agrees with Mupa and Chinooneka (2015) who said that teachers' instructional materials are limited to textbooks and syllabuses and do not go beyond that. Pupils learn in harsh and unconducive teaching and learning environments and there is low morale among pupils.

Also, limited number of Mathematics teaching and learning materials (TLMs) affects their performance in mathematics. This is affirmed by Eshiwani (1988) cited in Tanieth (2013) who indicated that most schools which perform poorly spend less money on the purchase of teaching resources and the availability of adequate relevant text books makes the teaching task easy. The study also found out that large class sizes affect their performance in mathematics. This is in line with the findings of Achilles, Harman & Egelson (2010) who revealed that large class size negatively affects pupils' academic performance. Similarly, Farooq (2011) found that class size is a significant factor of academic performance and that studies have indicated that schools with smaller class sizes do better academically than schools with larger class sizes.

In addition, high teacher-student ratio affects their performance in mathematics. Githua (2002) emphasized that for education to be effective, especially at the junior school level, teaching staff strength has to be adequate. A student-teacher ratio of 40:1 may be considered adequate but where they exceed, the teacher cannot perform effectively and efficiently. Poor classroom learning environment affects pupils' performance in mathematics. According to Sorensen (2003) a classroom environment is affected by both physical and psychological factors. Having emotionally safe and encouraging classroom climate is equally important, in creating an effective environment, as the physical makeup of the room (Sorensen, 2003). Moreover, poor school environment affects pupils performance in mathematics. Oskemp, (2002) noted that the effects of the school environment on the child that educators are interested in the child's environment, as this, rather than heredity is the phenomenon they can easily control in order to enhance teaching, learning and achievement.

Furthermore, lack of quality physical facilities in schools affects their performance in mathematics. Zambaga (2017) affirmed that the excellence of the physical facilities provide the required ambience which positively determines positive student performance in their respective schools. Limited number of Mathematics reading materials and other resources affect their performance in mathematics. This coincides with the findings of Etsey (2005), who found out that teaching and learning materials to be less adequate in the Shama sub-metro schools. Since there were less TLMs in the Shama sub-metro schools, the situation made it difficult for the pupils to understand the lessons and this led to lower performance.

What are the student related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipality?

The second research objective seeks to identify student related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipality. The study showed that lack of commitment on the part of pupils affect their performance in mathematics. Anderson (2011) confirmed that a child who is commitment to what he learns will be highly motivated to engage in activities that promote learning thereby developing a positive self-concept in relation to the total teaching environment. Also, low academic ambitions affect their academic performance in mathematics.

Moreover, pupils' poor learning style of mathematics affect their performance in mathematics. In this regard Entwistle and Ramsden (1983) stated that learner chooses a specific learning style depending on their cognition of the learning task. They (Entwistle & Ramsden, 1983) go on to say that learners adapt their learning style through contact with other learners. Lack of motivation for studying mathematics was also found to affect their performance in mathematics. According to Diaz (2003) when

a student is strongly motivated, all his effort and attention are directed toward the achievement of a specific goal, thus bringing to bear all his or her resources. Also, lack of self-confidence affects their performance in mathematics. According to Poku (2019) pupils with higher confidence levels in mathematics tend to have the flair for mathematics with consequential higher academic performances.

Furthermore, inadequate effort towards mathematics affect their performance in mathematics. According to Munn (2009) Student's attitudes towards mathematics have been found to be positive in the early years of primary schooling, but decline as they progress to upper classes. It is, therefore, necessary for mathematics teachers to strive and sustain positive attitudes towards mathematics for good performance in the upper classes. Pupils' low self-concept affect their performance in mathematics. This confirms to the findings of Helmke and Van Aken (1995) cited in Tanieth (2013), they found that elementary school achievement did not affect prior self-concept. Finally, lack of interest in mathematics studies affect their performance in mathematics. In this regard, Maree (1994) stated that learners' interest and ability are positively related. According to Maree (1994) the better a learner performs in mathematics, the more he/she will like the subject and vice versa.

What teacher related factors affect pupils' performance in mathematics among junior high schools in the Effutu Municipality?

The third research objective seeks to establish teacher related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipality. The study showed that inadequacy of professional teachers does not significantly affect pupils' performance in mathematics. According to Lockheed &Verspoor (2011) lack of drive and professional commitment produce poor attendance and unprofessional

attitudes towards pupils, which, in turn, affect pupils' performance academically. Teacher incompetence does not significantly affect their performance in mathematics. According to Shaveson, McDonnell and Oakes (1989) cited in Adane (2013) stated that teachers with only minimal competence can perform quite adequately, given supportive and favourable working conditions. Lack of mentorship for teachers significantly affects their performance in mathematics.

Moreover, inadequate teaching experience does not significantly affect their performance in mathematics. This is in line with Mupa and Chinooneka (2015) who establishes no significant relationship between teacher experience and learners mathematical achievement. Akey (2006) found in their meta-analytical study that teaching experience had a positive and significant effect on student achievement. Also, low level of teacher qualification significantly affects their performance in mathematics. The foregoing findings is in congruent with the studies of Asikhia, (2010) who revealed that, while the teachers noted their qualification did not account for poor academic performance of pupils, the pupils, however, noted that it accounted for the poor academic performance. Additionally, Abuseji (2007) found teacher's qualification to be the second most potent causal effect on student's achievement in chemistry. Again, results indicated that methods and techniques of teaching mathematics affect their performance in mathematics. This is in consonance with the study of Donkor (2010) who found that teaching methods adopted by teachers during instructions in classes have been found to greatly influence the learning of pupils. In a similar study, it was found that teachers indicated that the method of teaching may cause poor academic performance while the pupils held a contrary opinion (Asikhia, 2010).

Furthermore, results indicated that teacher impatience for slow learners significantly affect their performance in mathematics. In addition, lateness to school affects their performance in mathematics. The finding is similar with the studies of Etsey (2005) who found that lateness and absenteeism affect completion of syllabi. When the syllabus is not completed, pupils find it difficult to understand content that is to be taught in the next class which foundation in most cases is based on the previous class. Finally, it was found that poor attitude towards learners affect their performance in mathematics. The finding is similar with studies of Suleiman and Hammed (2019) who found that if a learner believes a teacher has a low opinion of him/her; it is possible that the learner will perform accordingly. Similarly, Fennema and Romberg (1999) state that it is not only the teachers' beliefs about mathematics and its usefulness that are important, but also that the teachers' beliefs about their learners' ability to do mathematics have an influence on how they teach and subsequently on how learners learn.

What home related factors affect pupils' performance in mathematics among junior high schools in the Effutu Municipality?

The fourth research objective seeks to examine home related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipality. The study showed that that parent's level of education affect their performance in mathematics. The finding confirms the studies of McKeachie (2009) who found that parental level of education influences academic performance of their wards. This means that parents with less or no education are likely to have their wards performing poorly academically owing to the fact that, their status in society might not permit them to contribute positively to the academic performance of the pupils. Also, parent occupation affect their performance in mathematics. Fertig and Schmidt (2002) elucidated that parental occupational background due to full-time job have significant effects on pupil academic performance. Again, parent income affect their performance in mathematics. According Escarce (2003) parent income has a profound influence on the educational opportunities available to adolescents and on their chances of educational success.

Moreover, family background affect their performance in mathematics. According to Engin-Demir (2009) pupils' academic achievement has been influenced by background of family characteristics such as socioeconomic status of parents. Nutrition and health status affect their performance in mathematics. This is in consonance with the study of Harbison and Hanushek (1992) cited in Zambaga (2017) who establish a statistically considerable relationship between health and nutritional indicators and academic performance. Inspired by the above findings a conclusion was made to the effect that, the poor health and nutritional status as determining factor of academic performance starts at early childhood. Also, large family size affect their performance in

mathematics. The finding is in line with the studies conducted by Nutall *et al.,* (2000) who concluded that boys from small families tended to have better academic achievement than boys from large families because boys in the larger families are probably more influenced by peer groups who tend to have anti-academic values.

Furthermore, parental involvement in academic work affect their performance in mathematics. This is in line with the study of Conway and Houtenwille (2008) who found that parental involvement has a strong positive effect on student achievement.

It is then stated that parent's level of education, parent's occupation, parent's income, and family backgrounds, nutrition and health status, large family size and parental involvement in academic work were home related factors that affect pupils' performance in mathematics among junior high school in the Effutu Municipalityity.

4.5 Summary of Findings

Findings on school related factors that affect pupils' performance in mathematics among junior high school in the Effutu Municipalityity reveals that majority of the pupils agreed that limited use of instructional materials in mathematics, limited number of Mathematics teaching and learning materials (TLMs), large class sizes, high teacher-student ratio, lack of quality physical facilities, limited number of Mathematics reading materials and other resources in school library affect pupils' performance in mathematics among junior high school in the Effutu Municipalityity.

Findings on student related factors that affect pupils' performance in mathematics among junior high school in Effutu Municipalityity reveals that majority of the pupils agreed that lack of commitment on the part of pupils, low academic ambition, pupils' poor learning styles of mathematics, pupils' lack of motivation for studying mathematics, pupils lack of self-confidence, inadequate effort towards mathematics and

lack of interest in Mathematics studies affect pupils' performance in mathematics among junior high school in the Effutu Municipalityity.

Findings on teacher related factors that affect pupils' performance in mathematics among junior high school in Effutu Municipalityity reveal that lack of mentorship for teachers, teacher impatience for slow learners, lateness to school, poor attitude towards learners, methods and techniques of teaching mathematics affect pupils' performance in mathematics among junior high school in the Effutu Municipalityity.

Finally, findings on home related factors that affect pupils' performance in mathematics among junior high school in Effutu Municipalityity reveals that parent's level of education, parent's occupation, parent's income, and family backgrounds, nutrition and health status, large family size and parental involvement in academic work affect pupils' performance in mathematics among junior high school in the Effutu Municipalityity.

CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Overview

This chapter contains the summary of the study, summary of key findings and conclusion drawn based on the findings of the study, recommendations based on the findings and suggestions for further studies.

5.1 Summary of the Study

Pupils' performance in Mathematics over the years has become a challenging issue in Ghana such that the policy makers, the Ministry of Education and its allied agencies are making frantic efforts to curb the situation. Thus, the study aimed to investigate the factors that affect the performance of pupils in mathematics among public junior high schools in the Effutu Municipality. To identify the factors, the following research questions were formulated as a guide to the study.

1. What are the school related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipality?
2. What are the pupils' related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipality?
3. What teacher-related factors affect pupils' performance in mathematics among junior high schools in the Effutu Municipality?
4. What are the home related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipality?

The findings of the study would go a long way in generating the much needed information that would be used by various stakeholders in the Municipality, particularly at the basic education level, to fashion out appropriate strategies to improve academic performance of pupils in mathematics. In this regard, the study would be useful to

schools in the Municipality in the analysis of the factors that affect pupils' performance in mathematics in BECE. The study was limited to factors that affect the performance of pupils in mathematics among junior high schools in the Effutu Municipalityity. The literature review reveals that identifying the most contributing factor that affects student academic performance is a very complex and challenging job. The pupils in public schools belong to a variety of backgrounds depending upon their demography. This diversity is much vast and complex as ever before in Effutu Municipalityity.

The study used a descriptive survey design. The study fits within the provision of descriptive survey research design because the researcher collected data and reported the way things were from respondents statistically without manipulating any variables. Purposive sampling procedure was used to select ten (10) mathematics teachers and simple random sampling procedure was used to select one hundred and one (110) junior high school pupils in the Effutu Municipalityity. The instruments used in this study were interview guides for the mathematics teachers and questionnaires for junior high school pupils. Each questionnaire responses from the junior high school pupils were analysed descriptively using frequency tables and simple percentage. Responses from interview schedule were analysed qualitatively using thematic approach.

5.2 Key Findings

The study explored factors that affect the performance of pupils in mathematics among public junior high schools in the Effutu Municipalityity, and the following were the findings thereof:

1. The first research question sought to find out school related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipality. Findings indicated that; limited use of instructional materials in mathematics, limited number of Mathematics teaching and learning materials (TLMs), large class sizes, high teacher-student ratio, lack of quality physical facilities, limited number of Mathematics reading materials and other resources in school library were the school factors that affect their performance in mathematics.
2. In line with the research question two which south to find out the pupils' related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipality; the findings revealed that lack of commitment on the part of pupils, low academic ambition, pupils' poor learning styles of mathematics, lack of motivation for studying mathematics, pupils lack of self-confidence, inadequate effort towards mathematics and lack of interest in Mathematics studies were the student factors that affect their performance in mathematics in junior high school in the Effutu Municipality.
3. Based on the third research question which sought to find out teacher-related factors affect pupils' performance in mathematics among junior high schools in the Effutu Municipality, the findings revealed that; lack of mentorship for teachers, teacher impatience for slow learners, lateness to school, poor attitude towards learners, methods and techniques of teaching mathematics were the

teacher-related factors that affect their performance in mathematics in junior high school in the Effutu Municipality.

4. In line with research question four which sought to find out the home related factors that affect pupils' performance in mathematics among junior high schools in the Effutu Municipality the findings indicated that parent's level of education, parent's occupation, parent's income, family backgrounds, nutrition and health status, large family size and parental involvement in academic work were the home related factors that affect their performance in mathematics in junior high school in the Effutu Municipality.

5.3 Conclusions

From the data collected, analysed and the findings made, the following conclusions were drawn;

The study concluded that, limited use of instructional materials in mathematics, limited number of Mathematics teaching and learning materials (TLMs), large class sizes, high teacher-student ratio, lack of quality physical facilities, limited number of Mathematics reading materials and other resources in school library were school related factors that affect pupils' performance in mathematics among junior high school in the Effutu Municipalityity.

Also, lack of commitment on the part of pupils, low academic ambition, pupils' poor learning styles of mathematics, pupils' lack of motivation for studying mathematics, pupils lack of self-confidence, inadequate effort towards mathematics and lack of interest in Mathematics studies were school related factors that affect pupils' performance in mathematics among junior high school in the Effutu Municipalityity.

Moreover, lack of mentorship for teachers, teacher impatience for slow learners, lateness to school, poor attitude towards learners, methods and techniques of teaching mathematics were teacher related factors that affect pupils' performance in mathematics among junior high school in the Effutu Municipalityity.

Finally, parent's level of education, parent's occupation, parent's income, and family backgrounds, nutrition and health status, large family size and parental involvement in academic work were home related factors that affect pupils' performance in mathematics among junior high school in the Effutu Municipalityity.

5.4 Recommendations

The following recommendations are made based on the summary and conclusion drawn.

1. Ghana Education Service in Effutu Municipality should provide the Effutu Circuit schools with adequate teaching and learning materials; provide adequate classrooms for teaching and learning and also organise workshops for mathematics teachers on efficient use of instructional materials during classroom deliveries. This will enhance the teaching and learning of mathematics in the municipality.
2. Teachers should liaise with parents' of pupils to encourage, motivate and stir pupils' interest in the learning of mathematics by giving special prize to student who performs well in the subject. This will motivate, arouse and increase pupils' interest in mathematics.
3. The Effutu Municipality Education Directorate should organise workshops/ educational seminars for teachers on the need to develop positive attitudes towards their pupils so that the pupils can readily approach and relate with them.

This will help the pupils to easily communicate to them whatever issues bothering them. Also teachers should be encouraged to avoid lateness to school, adopt teaching techniques that will benefit both slow and fast learners. This will help enhance and teaching and learning of Mathematics in the Municipality.

4. The school authorities in collaboration with the school management committee should educate parents on the need to devote time for the academic work of the pupils.

5.5 Suggestion for further Studies

Further studies can be done on the perceived administrative and community factors responsible for poor academic performance. This will provide knowledge on the administrative and the community factors that cause pupils poor academic performance.

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APPENDICES

APPENDIX A

Questionnaire For Junior High School Pupils

UNIVERSITY OF EDUCATION, WINNEBA

DEPARTMENT OF BASIC EDUCATION

Dear Student,

This questionnaire aims at collecting information about the factors that affect the performance of pupils in mathematics among junior high school in the Effutu Municipalityity. Your responses are for academic purpose. Your candid responses to this questionnaire would help find answers to the problem under investigation.

I would be very grateful if you would complete this questionnaire as accurately and objectively as possible. Tick (√) the appropriate response as applicable to the question and fill in the blank spaces where answers are not supplied. Your response would be treated with the utmost care and would be accorded the needed confidentiality it deserves.

Thank you for your cooperation.

PART ONE

Demographics Of Respondents

Please help us classify your response by supplying the following facts about yourself and your opinion on the raised issues by ticking an appropriate box. There is no right wrong answer therefore no particular response is targeted.

1. Gender

a. Male ( )
b. Female ( )

2. Age range

a. 11 - 15 ( )
b. 16 - 20 ( )
c. 20 + ( )

3. Form of student

a. JHS 1 ( )
b. JHS 2 ( )
c. JHS 3 ( )

4. Parental Marital Status

a. Single/ Divorce ( )
b. Intact ( )

5. Living Statuses

a. Mother only ( )
b. Father only ( )
c. Both parents ( )
d. Other relatives ( )

6. Educational level of your guardian or one you stay with

a. Tertiary ( )
b. Secondary ( )
c. Basic ( )
d. Uneducated ( )

PART TWO

SECTION A

SCHOOL-RELATED FACTORS THAT AFFECT THE PERFORMANCE OF PUPILS IN MATHEMATICS

Instruction: This section seeks to examine school related factors that affect your performance in mathematics among junior high schools in the Effutu Municipalityity? Please indicate your level of agreement or disagreement on the statements below. They have been rated from SA = Strongly Agree, A = Agree, Un = Undecided, SD = Strongly Disagree and D = Disagree. Tick (√) as appropriate.

S/N	Statements	SA	A	UN	D	SD
	School related factors that affect your performance as pupils in mathematics are:					
1	Limited use of instructional materials in Mathematics					
2	Limited number of Mathematics teaching and learning materials (TLMs)					
3	Large class sizes.					
4	**High teacher- Student Ratio**					
5	Poor class room learning environment.					
6	Poor school environment					
7	Lack of quality physical facilities in schools					
8	Limited number of Mathematics reading materials and other resources in school library					
9	Inadequate supervision					

SECTION B

STUDENT-RELATED FACTORS THAT AFFECT THE PERFORMANCE OF PUPILS IN MATHEMATICS

Instruction: This section seeks to identify student related factors that affect your performance in mathematics among junior high schools in the Effutu Municipalityity? Please indicate your level of agreement or disagreement on the statements below. They have been rated from SA = Strongly Agree, A = Agree, Un = Undecided, SD = Strongly Disagree and D = Disagree. Tick (√) as appropriate.

S/N	Statements	SA	A	UN	D	SD
	Student related factors that affect your performance as pupils in mathematics are:					
10	Poor attitude of pupils towards mathematics					
11	Lack of commitment on the part of pupils					
12	Low academic ambition					
13	Pupils' poor learning styles of Mathematics					
14	Pupils' lack of motivation for studying Mathematics					
15	Pupils lack of self-confidence					
16	Inadequate effort towards Mathematics					
17	Pupils' low self-concept					
18	Lack of interest in Mathematics studies					

SECTION C

TEACHER-RELATED FACTORS THAT AFFECT THE PERFORMANCE OF PUPILS IN MATHEMATICS

Instruction: This section seeks to examine teacher related factors that affect your performance in mathematics among junior high schools in the Effutu Municipalityity? Please indicate your level of agreement or disagreement on the statements below. They have been rated from SA = Strongly Agree, A = Agree, Un = Undecided, SD = Strongly Disagree and D = Disagree. Tick (√) as appropriate.

S/N	Statements	SA	A	UN	D	SD
	Teacher related factors that affect your performance as pupils in mathematics are:					
19	Inadequacy of professional teachers					
20	Teacher incompetence					
21	Lack of mentorship for teachers					
22	Inadequate teaching experience					
23	Low level of teacher qualification					
24	**Methods and techniques of teaching Mathematics**					
25	Teacher impatience for slow learners					
26	Lateness to school					
27	Poor attitude towards learners					

SECTION D

HOME-RELATED FACTORS THAT AFFECT THE PERFORMANCE OF PUPILS IN MATHEMATICS

Instruction: This section seeks to examine home related factors that affect your performance in mathematics among junior high schools in the Effutu Municipalityity? Please indicate your level of agreement or disagreement on the statements below. They have been rated from SA = Strongly Agree, A = Agree, Un = Undecided, SD = Strongly Disagree and D = Disagree. Tick (√) as appropriate.

S/N	Statements	SA	A	UN	D	SD
	Home related factors that affect your performance as pupils in mathematics are:					
28	Parent's level of education					
29	Parent's occupation					
30	**Parent's income**					
31	**Family backgrounds**					
32	**Nutrition and health status**					
33	**Large family size**					
34	**Parental Involvement in academic work**					
35	**Inadequate supervision**					
36	**Broken homes**					

APPENDIX B

Interview Guide for Mathematics Teachers

1. In your opinion, what are some of the school related factors that affect the performance of pupils in mathematics among junior high schools in the Effutu Municipalityity?
2. What are some of the student related factors that affect the performance of student in mathematics among junior high schools in the Effutu Municipalityity?
3. What are some of the teacher related factors that affect the performance of student in mathematics among junior high schools in the Effutu Municipalityity?
4. What are some of the home related factors that affect the performance of student in mathematics among junior high schools in the Effutu Municipalityity?