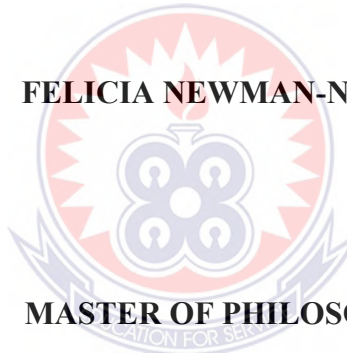


UNIVERSITY OF EDUCATION, WINNEBA

**FACTORS CONTRIBUTING TO POOR ACADEMIC PERFORMANCE IN
MATHEMATICS AMONG JUNIOR HIGH SCHOOL PUPILS IN THE
HOHOE MUNICIPALITY, GHANA**

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MASTER OF PHILOSOPHY

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UNIVERSITY OF EDUCATION, WINNEBA
FACULTY OF SCIENCE EDUCATION
DEPARTMENT OF MATHEMATICS EDUCATION

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**A thesis in the Department of Mathematics Education,
Faculty of Science Education, submitted to the School of
Graduate Studies, in partial fulfilment of
the requirement for the award of the degree of
Master of Philosophy
(Mathematics Education)
In the University of Education, Winneba**

NOVEMBER, 2023

DECLARATION

Candidate's Declaration

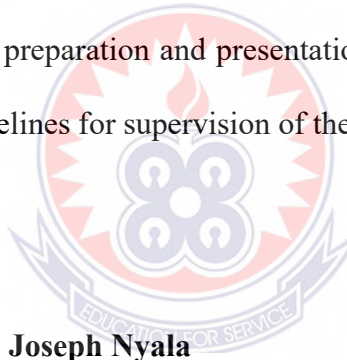
I, Felicia Newman-Naami declare that this thesis, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

Signature:

Date:

Supervisor's Declaration

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



Supervisor's Name: Dr. Joseph Nyala

Signature:

Date:

DEDICATION

To my children: Jessica, Mildred, Caleb, Samuel and my husband Michael Subbey. I
love you



ACKNOWLEDGMENTS

I thank Dr Joseph Nyala for his role of supervising my work and for the various direction towards the success of the work. I will like to acknowledge authors of various articles that helped me to complete my research work.



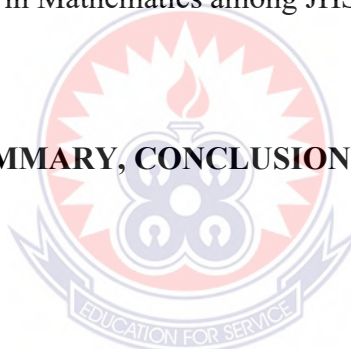
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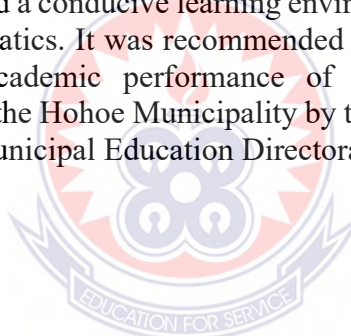
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ABSTRACT

Poor academic performance in Mathematics among public basic school pupils has attracted a lot of attention among stakeholders in education in Ghana including Hohoe Municipality. Therefore, this pragmatist study sought to investigate factors contributing to poor academic performance in Mathematics among junior high school (JHS) pupils in the Hohoe Municipality. The study adopted sequential explanatory mixed methods design within mixed methods approach. A sample of 311 (291 pupils, 10 Mathematics teachers and 10 parents) was selected for the study. Systematic random and convenience sampling techniques were used to select respondents in this study. Questionnaire and interview guide were used to collect data. Descriptive statistics were used to analyse the quantitative data while the qualitative data were analysed using themes and direct quotes. It was found that pupil negative attitudes towards the studying of Mathematics contributed to their poor academic performance. Also, Mathematics teachers' negative attitudes towards teaching contributed to poor academic performance of JHS pupils. However, home factors did not contribute to the poor academic performance of JHS pupils. Again, school factors did not contribute to the poor academic performance of JHS pupils. It was concluded that poor academic performance of JHS pupils in Mathematics was as a result of mathophobia. Again, it was concluded that the way and manner Mathematics teachers teach the subject contributed to poor academic performance of JHS pupils. Additionally, parents provided the necessary home support for their children's education in Mathematics. Finally, the school created a conducive learning environment for JHS pupils to improve their learning in Mathematics. It was recommended that in-service training on factors contributing to poor academic performance of pupils should be given to all Mathematics teachers in the Hohoe Municipality by the personnel in-charge of training and supervision at the Municipal Education Directorate, Hohoe.



CHAPTER ONE

INTRODUCTION

1.0 Overview

This chapter is the introductory section of the study which presents the background to the study, statement of the problem, purpose of the study, research objectives, research questions, significance of the study, delimitations of the study, limitations of the study and the organisation of the study.

1.1 Background to the Study

Globally, education is seen as one of the key components of human and national development (Wambugi, 2014). This is because; education plays a significant role in the political, economic and social development of every country. As noted by Wambugi (2014), education is considered as a critical resource in that it helps a country to particularly equip the youth with respect to knowledge, skills and expertise in enabling them to be actively involved in the development of that country.

Similarly, it has been argued that education is one of the tools for the integration of society and for the realisation of personal development, national consciousness, and promotion of unity, economic, political, scientific, cultural and technological development (Afe, 2012). In this sense, the ability of a nation to develop largely depends on the availability of quality education to its citizens. The relevance of education that has been underscored globally has paved the way for the Ghanaian economy to put measures in place in ensuring that, its citizens are educated to acquire the necessary skills, knowledge and expertise to aid in the development of the country. The manifest function of education for a developing country like Ghana, therefore, is for the citizens to acquire the skill of literacy and numeracy

(Baafi-Frimpong, Yaquarh, & Milledzi, 2016). Looking at the manifest function of education in Ghana, it is very clear that numeracy, which emphasises computational skills and particularly mathematics, is very important. This is because, mathematics as a subject has a direct relationship with other subjects that are technical and scientific in nature.

It is in this view that Tshabalala and Ncube (2013) stressed that mathematics is the bedrock and a tool for scientific, technological and economic advancement of any country. Mathematics is very vital not only because of the academic qualification one obtains, but also prepares the individual for the future irrespective of the work of life he or she chooses (Davies & Harsh, 2012). It must be pointed out that, mathematics relates to everything in the universe which is connected to the daily life of individuals and thus, it remains the subject that education and humans cannot function meaningfully without (Mefor, 2014).

Nyaumwe (2013) stated that Mathematics education is a bedrock and an indispensable tool for scientific and economic advancement of a person and a nation at large. It is a fundamental part of human thought and logic in his attempt to understand the worldview of the environment in which he lives (Makondo & Makondo, 2020). Makondo and Makondo (2020) further argued that Mathematics plays a crucial role in human life. This concurs with Nyaumwe (2013) who posited that Mathematics provides an effective way of building mental discipline and encourages logical reasoning. Mathematics prepares one for the future world. Consequently, many nations take mathematics as a compulsory subject at the basic school level since it is a fundamental subject for human life.

Learners' academic performance in Mathematics globally and locally has been a major concern. Learners are generally not performing well in Mathematics. Poor learner

academic performance in Mathematics has been a global concern that has prompted developing countries to participate in initiatives to bring positive change in their communities (Sinyosi, 2015). This connotes that Mathematics underperformance has become a perennial concern which can prevent these developed and developing countries from achieving their developmental goals. International studies by Asikhia (2010) found that, in Britain, the reasons for poor performance in Mathematics are a lack of learning support; principal teachers' dissatisfaction with the in-career training of teachers in Mathematics; and learners taught by teachers who have not participated in career professional development.

Additionally, the reports of various national and international bodies such as the International Mathematics Union (IMU) indicate that "primary and secondary level Mathematics education is weak in most African countries, reducing the potential population of talented students who choose mathematics majors at university level" (IMU, 2020). Further, in the South African context, the research by Cascio (2013) found that educators play a significant role in learners' school performance; for example, if the educator lacks experience or passion about teaching, the learners might not be able to develop comprehensive understanding of the subject material. It is further assumed that, if the educator does not have effective classroom management skills.

In Ghana, Mathematics and more specifically, core Mathematics is given all the necessary importance regarding the curriculum and all educational policies from the basic level to the secondary level. Sa'ad, Adamu and Sadiq (2014) explained that core Mathematics helps the individual to develop basic computational skills which foster the desire and the ability to be accurate in problem-solving and also prepares the mind of the individual to appreciate and understand further Mathematics.

It suggests that in academic performance, examination has therefore elicited a great research interest among scholars who have tried to investigate the factors that influence students' academic performance in Mathematics. Wekesa (2013) noted that there are many factors, which influence a students' academic performance in Mathematics. Some of these factors are external to the school, while others are internal. Internal factors are as follows: Adequacy of teaching and learning resources, leadership and decision-making, effects of absenteeism on performance, adequacy of teacher personnel, school culture and climate, teachers' behaviours. External factors are as follows: Academic and professional training of teachers, entry marks used as screening device, parental support and involvement, socio-economic background of students (Wekesa, 2013).

For instance, in relation to school factors, Tata (2013) found that, students' negative attitude toward mathematics, fear of mathematics, inadequate qualified teachers and inadequate teaching materials were some of the causes of poor performance in Mathematics. Tata (2013) further found that developing positive attitude, motivation and proper guidance toward Mathematics and provision of relevant teaching materials could make students perform better in Mathematics. Moreover, Isack (2015) found that among other factors students' poor background in Mathematics negatively affected students' academic performance in Mathematics. Again, Mabena, Mokgosi and Ramapela's (2021) study found that numerous factors influenced learners' confidence and performance. The factors found to have an impact on Mathematics performance were learner related, such as ill-discipline, language barriers and learner attitudes.

In line with teacher factors, Forrest, Lowe, Potts and Poyser (2019) found that the quality of teachers influences learners in learning Mathematics. According to Chen, Wei and Jiang (2017), strong evidence exists showing that teacher diligence, dedication, and adherence to basic educational policies and processes can lead to good

teaching and learning. Chen, Wei and Jiang (2017) further asserted that issues around the maximisation of contact time with learners in class, and the presence of both learners and teachers at school and in class, have a positive impact on performance.

Besides, Mabena, Mokgosi and Ramapela (2021) discovered that numerous factors influenced learners' confidence and performance. These researchers found that factors that impact on Mathematics performance of students were teacher-related, such as lack of pedagogical content knowledge and skill, and lack of appropriate professional training.

Additionally, researchers such as Biotenbeck (2011) and Clements (2013) associated students' failure in Mathematics with teachers' teaching practices. Biotenbeck (2011) defined teaching practices as what teachers do in the classroom, how teachers apply instructional methods and traditional ways of teaching. These were such as lecture style teaching, teacher centre methods and rote memorisation in teaching Mathematics learning materials, mixing of two languages of English and Kiswahili which confuse students.

Mefor (2014) also noted that teachers who do not possess the required academic and professional qualifications would consequently have a negative influence regarding the teaching and learning of their subjects. It was further stressed that, teachers who possess the required academic and professional qualification but work under unfavourable terms and conditions would be less dedicated to their work and become less productive than unqualified teachers who work under favourable conditions and terms of service which will consequently affect students' academic performance in Mathematics.

Regarding home factors, Attwood (2014) attribute poor performance in Mathematics to parental attitude and interrupted teaching. Also, Karue and Amukowa (2013) argued that home environmental factors and family backgrounds as well as little participation

of parents in the education of their children were the main causes of poor performance in Mathematics. Again, Cascio (2013) found that family-related factors play a critical role in learners' academic performance in Mathematics. Parents who are too occupied to care about their children's performance contribute to children losing their academic focus. Similarly, poverty-stricken families were found to negatively affect their children's academic performance (Cascio, 2013). Some parents were found to be abusive, which caused learners' academic performance in Mathematics to decline dramatically. Learners who come from abusive families tend to perform badly at school (Cascio, 2013).

For school factors, Landicho's (2021) study found that lack of workbook/textbooks as instructional materials highly affected the academic performance of Grade Eleven students' academic performance in Mathematics in Talumpok Integrated School. In addition, Makhubele and Luneta's (2014) study found that schools in their study allocated 110 minutes per week to senior phase Mathematics. This means about an hour of Mathematics teaching is lost per week. This is a significant amount of time lost per term and per year, which results in a chronic and systemic reduction of teaching and learning in class that affects performance in the subject (Makhubele & Luneta, 2014).

Factors such as availability and use of teaching and learning materials, class size, home-based factors, school environment and parental factors, among others, have been noted to affect students' academic performance (Mefor, 2014; Tshabalala & Ncube, 2013). It should be noted that, the presence of all or some of the factors identified in literature discussed, might have caused the poor academic performance of Junior High School pupils in Mathematics in the Hohoe Municipality in the Volta Region of Ghana. Most importantly, it is appropriate to obtain evidence of the factors responsible for the poor academic performance of pupils in Mathematics in the Hohoe Municipality.

Source: Hohoe Municipal Education Directorate's Report, (2021)

In Table 1.1 revealed that, in 2015, 2,063 candidates were presented for the BECE. Out of this number, 963 candidates passed, representing 46.69% whilst 1,100 failed representing 53.31% (Hohoe Municipal Education Directorate's Report, 2021). In the 2016, the Hohoe Municipality presented 2,054 candidates. Out of this, 862 passed representing 41.96% whilst 1,192 failed representing 58.10% (Hohoe Municipal Education Directorate's Report, 2021). In furtherance, in 2017, the Municipality presented 2,053 candidates out of which 998 passed and 1,055 failed representing 48.61% and 51.39% respectively (Hohoe Municipal Education Directorate's Report, 2021).

Additionally, in 2018, 2,317 candidates were presented. Out of this, 1,256 candidates passed, 1,061 candidates failed representing 52.11% and 47.89% respectively (Hohoe Municipal Education Directorate's Report, 2021). Also, in 2019, 2,093 candidates were presented for the BECE. Out of this number, 1,091 candidates passed, representing 52.11% whilst 1,002 failed representing 47.89% (Hohoe Municipal Education Directorate's Report, 2021). In furtherance, in 2020, 2,441 candidates were presented for the BECE. Out of this number, 981 candidates passed, representing 40.20% whilst 1,460 failed representing 59.80% (Hohoe Municipal Education Directorate Report, 2021).

In the Hohoe Municipality, it has been noticed that the academic performance of Junior High School pupils in Mathematics is poor (Hohoe Municipal Education Directorate's

report, 2020). With reference to the relevance of Mathematics, the low academic performance in the subject in the Municipality poses relevant questions regarding its cause. This is because, Mathematics is recognised as a core subject in Ghana and thus, pupils' inability to pass can result in difficulties in progressing to the next educational level (Senior High School).

Considering the relevance of Mathematics in our educational systems and in the lives of individuals, the poor academic performance of pupils in Mathematics in the Hohoe Municipality raises critical questions. Prominent among these questions is whether the causes emanate from students, teachers, home and school environment. These are critical issues which have created a lot of concerns for some time now in the Hohoe Municipality that need to be addressed. For example, the Municipal Director of Education in the Hohoe Municipality from time immemorial has been emphasising that the relatively poor academic performance of Junior High School pupils in Mathematics must be taken seriously, and come out with the factors that are responsible for it (Hohoe Municipal Education Directorate Report, 2021).

Though some studies had been conducted, yet, gaps had been identified. For example, in the western world, Landicho (2021) investigated factors affecting performance in general Mathematics of Grade Eleven students in Talumpok Integrated School in Philippines. It was found that study habit, interest, and lack of workbook/textbooks as instructional materials highly affect the academic performance of the students.

In Africa, Makondo and Makondo (2020) examined causes of poor academic performance in Mathematics in Mavuzani High school in Zimbabwe. The results showed that teaching methods, pupils' negative attitudes towards Mathematics, lack of teaching experience by some teachers, instability of teachers and lack of adequate

resources are some of the causes of poor academic performance in Mathematics at Ordinary level.

However, the current study differs from these studies in terms of the variables, study centre, research paradigm, approach and design, population and sample, and data collection instruments. It is in this regard that the study has become necessary to obtain evidence of the factors contributing to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality, Ghana.

1.3 Purpose of the Study

Pupils' academic performance in Mathematics is a key feature in education. This study was therefore conducted primarily to investigate factors contributing to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality, Ghana.

1.4 Research Objectives

The study sought to:

1. Examine the extent to which pupil factors contribute to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality.
2. Identify how teacher factors contribute to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality.
3. Ascertain ways in which home factors contribute to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality.
4. Investigate school factors contributing to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality.

1.5 Research Questions

The following questions were formulated to guide this study:

1. To what extent do pupil factors contribute to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality?
2. How do teacher factors contribute to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality?
3. In what ways do home factors contribute to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality?
4. What are the school factors contributing to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality?

1.6 Significance of the Study

In the first place, since the study investigates variables like the student, teachers, home and school-related factors as well academic performance of pupils, the study is useful to the Junior High School in the Hohoe Municipality and Ghana at large in the analysis of factors responsible for the poor academic performance of pupils in Mathematics. Findings of the study are beneficial to all stakeholders in education especially at the Junior High School level to come out with appropriate strategies and policies that would enhance pupils' academic performance in Mathematics.

In addition, the findings of the study are beneficial to the Ghana Education Service and the Ministry of Education as they provide some guidelines in policy formulation regarding teacher's employment, provision of adequate tools and equipment, supervision, qualifications, teachers' experiences, among others, especially in the field of Mathematics to boost pupils' academic performance.

Furthermore, the findings of the study are useful to stakeholders of education such as measurement experts, curriculum developers in Mathematics, teachers and learners of Mathematics, school administrators, and guidance and counselling personnel at the Junior High School level and beyond, to be in the know of the factors that are

responsible for the poor academic performance of pupils. This would direct the actions of these stakeholders and provide appropriate measures to improve pupils' academic performance since academic performance is a critical psychological construct. The study is also useful in the sense that it adds to the body of knowledge regarding the factors contributing to poor academic performance of pupils especially in Mathematics. Lastly, findings of the study can be used by future researchers as a baseline for further studies.

1.7 Delimitations of the Study

The study was delimited to variables relating to student, teacher, home and school-related factors as factors contributing to poor academic performance of JHS pupils in Mathematics. In essence, the scope of the study was delimited to factors contributing to poor academic performance of JHS pupils in Mathematics in the Hohoe Municipality of the Volta Region of Ghana but not private JHS. Furthermore, the scope of the study covered Forms 1 and 2 Junior High School pupils, parents and Mathematics teachers in the Hohoe Municipality. Form 3 pupils were not included in the data collection because they were seriously preparing for their final examination and the researcher believed that they would not have time to respond to the items on questionnaires. Finally, this study adopted pragmatism paradigm (using mixed methods approach) together with sequential explanatory mixed methods design.

1.8 Limitations of the Study

Initially, very few of the interviewees felt reluctant to share their views on the topic perhaps with the view that information shared would be released to a third party. However, after they were reassured of confidentiality and anonymity, they opened up and shared their views. For this reason, this limitation did not adversely affect findings of the study. Also, findings of the study resulted from a sample of public Junior High

Schools in the Hohoe Municipality and thus, generalisation of the findings would be limited in this regard.

1.9 Operational Definition of Terms

For the purpose of this study, the following terms were operationally defined:

Academic Performance: This refers to a successful achievement of tasks in Mathematics. It particularly refers to the extent a pupil, teacher or institution has achieved both long term and short-term educational goals. It is a strong desire to achieve good grades that would lead to a fulfillment of desired dreams in one's academic life.

Home-Related Factors: This emphasises how the family is able to provide a tranquil atmosphere or environment, availability of physical materials which encourage learning in the home, provision of textbooks, provision of basic needs, and involvement in ensuring that children are monitored and are given the necessary support needed to encourage the academic performance of pupils in Mathematics.

School-Environmental Factors: This refers to the characteristics, climate and the general atmosphere of the school. It includes the facilities and physical environment of the school that promote the teaching and learning of Mathematics as well as the perceptions pupils have about their school.

Student-Related Factors: This refers to the wellbeing of students and the perception pupils have regarding their school environment, parent support and involvement, efforts in co-curricular activities, incidence of lateness, absenteeism and regularity at school. It also describes language use, enjoyment of teachers' lessons and the help students receive in their studies.

Teacher-Related Factors: This refers to how committed a teacher is with respect to his or her teaching, experience, qualification, mastery of content knowledge and his or her pedagogical skills, incidence of lateness and absenteeism, use of language in

teaching, completion scheme of work and syllabus, interest in students' understanding, and the work habit of the teacher.

1.10 Organisation of the Study

The study report comprises five chapters. Chapter one involved the introduction which covered the background to the study, statement of the problem, purpose of the study, research objectives and research questions. It also presents the significance of the study, delimitations of the study and limitations of the study and operational definition of terms. The chapter two focuses on the review of existing literature in relation to factors contributing to poor academic performance of Junior High School pupils in Mathematics. Specifically, the literature is reviewed in three main blocks namely: Theoretical framework, conceptual framework, the concept of Mathematics, the concept of academic performance, empirical review and chapter summary.

The methodology that was used in the study is captured in the chapter three. The chapter provides a description of the research paradigm, research approach, research design, population of the study, sample and sampling techniques and data collection instruments. The chapter also captures validity and reliability of the questionnaire, trustworthiness of the interviews, data collection procedures, data analysis procedures and ethical considerations. Chapter four presents the results and discussion of results while chapter five focuses on the summary, conclusion and recommendations and suggestions for further studies.

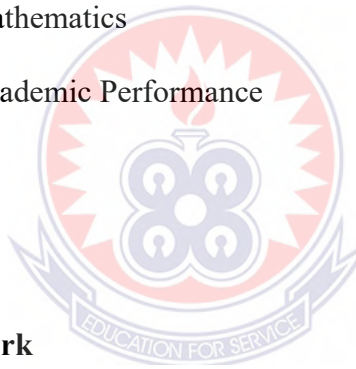
CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter deals with the literature review on factors contributing to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality, Ghana. The review of related literature would serve as a link between what had already been done and what is yet to be done in terms of research. The review of related literature would be discussed under the following subheadings:

1. Theoretical Framework
2. Conceptual Framework
3. The Concept of Mathematics
4. The Concept of Academic Performance
5. Empirical Review
6. Chapter Summary



2.1 Theoretical Framework

Constructivism Learning and Attribution Theories were used to underpin this study.

2.1.1 Constructivism Learning Theory

This theory was propounded by Piaget in 1971. A constructivism learning theory places the child in an active role in the learning process. Learning is not “swallowed whole” but lesson material is modified and transformed based on the child’s cognitive structures, social interaction, previous learning, and environment. Interaction with, and manipulation of Mathematical programmes is seen as critical to the development of mathematical knowledge, which is in a state of development and modification (Kuhn, 1974).

The rationale for the adoption of constructivist learning theory in this study rests on the notion that teaching should begin with content and experiences familiar to the pupils, so they can make connections to their existing knowledge structures. New knowledge should be presented in the context of real-life rather than abstract applications. Knowledge should be offered in a method that does not change learners' cognitive models extremely (Biggs & Tang, 2011). Furthermore, the adoption of constructivist learning theory was motivated by the idea of the zone of proximal development (ZPD), a principle of constructivism that emphasises a learner's ability to perform simple tasks when working with a teacher, parent, or capable peers, but which is frustrated when performing the task alone without support (Wass & Golding, 2014).

Teaching should enable students to fill the gaps and extrapolate information and materials presented by the teacher. The goal should be to empower learners with skills to be independent, and access relevant information from various sources to answer their problems and challenges (Vygotsky, 1978). Teaching should involve students working in small groups interacting and arguing to find solutions to the learning activities. This attribute of cooperative learning supports the forms and approaches of constructivism essential in social constructivism. The communication between the teacher and the learner is enhanced when it involves learners working together, where learners are helping one another to create more meaning for mathematical content.

Social constructivism applied in Mathematics teaching implies that Mathematics is taught by emphasising problem-solving, where the interaction would take place among teachers and learners and learners themselves. Learners must be encouraged to create their own strategies for problem-solving (Vygotsky, 1978). This is consistent with how Mathematics teachers in Hohoe Municipality are expected to teach. Their roles include facilitation,

mediation, and support of learning. As facilitators, they should always view learners as active participants in the learning process. Should learners experience barriers in this process, Mathematics teachers are expected to mediate through learning support processes. This discussion is relevant for the teaching and learning of Mathematics in JHS in the Hohoe Municipality in this study.

Teachers who are not very competent in using constructivist methods and principles in the teaching and learning of Mathematics are likely to have a negative influence on the performance of learners in the subject (Makgato, 2012). Since the concern is the poor academic performance of JHS learners in Mathematics and the fact that contributing factors to this situation are less known, examining and understanding these factors from the constructivist perspective hoped to bring solutions to improve the effective teaching and learning of Mathematics in line with the principles of constructivism.

2.1.2 Attribution Theory

Since human beings attribute their success or failure to something, the researcher selected the Attribution Theory of Weiner (1979) as one of the theoretical framework guiding this study. According to Weiner (1979), people attribute their success or failure in terms of causes. In order to understand causation of behaviour, they search for explanations or causes. They attempt to maintain a positive self-image when they do well by attributing the success to their own effort or abilities but if they do poorly, they believe it is because of factors beyond their control. They seek information that helps them to make attributions about causes and effect particularly in situations where the outcome is unexpected or negative. If the causation of an unpleasant behaviour is successfully attributed to something else, the individual feels better. The attribution theory assumes that the reasons people give

to explain their behaviour govern their behaviour and predictable ways from one situation to the other. If failure is attributed to lack of ability there will be a decrease in performance. Thus, the causes attributed to a particular behaviour will influence subsequent emotional and cognitive behaviour.

The Attribution theory is important in explaining future motivations since there might be affective reactions to success or failure if for example a learner fails and attributes it to lack of preparation. In future, such a learner will work hard, but if attributed to task difficulty he or she is likely going to be demotivated. Explanations, justifications and excuses about oneself or others influence the motivation of an individual to perform a task. The following aspects explain success and failure; ability, effort, task difficulty and luck.

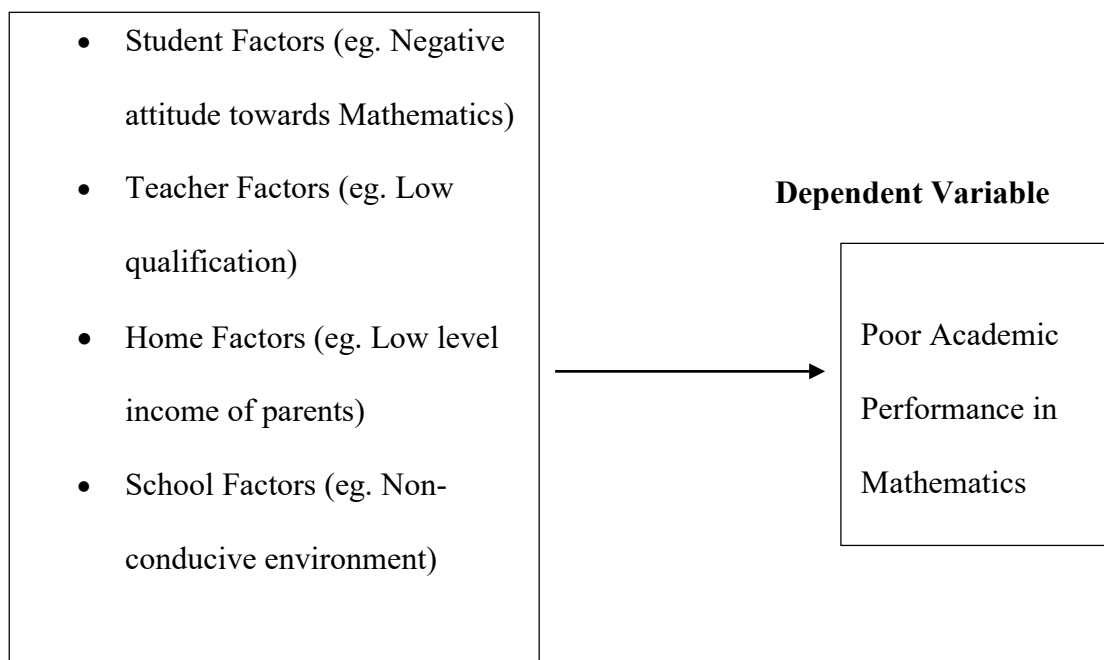
Human beings believe that certain dimensions influence the persons' interpretation of success or failure. These are internal or external, controllable or uncontrollable, and stable or unstable. Learned helplessness develop when a people believe that the events and outcomes in their lives are mostly uncontrollable. This will result in lack of motivation and reduction of self-esteem. The researcher noted that the Attribution theory is relevant in explaining this study in that pupils who performs poorly in Mathematics might attribute their poor academic performance to stable factors like difficulty of the subject and as such will expect to fail the subject even if they are given a second chance since Mathematics is viewed as a subject for those with greater intellectual ability. The theory is also relevant in that it highlights that failure diminish self-esteem where learners attribute failure in Mathematics to uncontrollable causes such as lack of ability. This will lead to lack of motivation to work hard and to seek help.

Further, the Attribution theory is relevant to this study in that causes of poor academic performance in Mathematics are attributed to other factors other than the pupils themselves. The reaction of the teacher to the pupils whose failure is perceived to be a result of lack of ability will impact on the child's future motivation. The teacher may sympathise with the learner and the learner may believe his/her failure is a result of uncontrollable causes and may not put effort. Thus, poor academic performance in Mathematics is attributed to many factors such as shortage of Mathematics teachers, pupils and Mathematics teachers' attitudes to the subject, lack of teaching and learning resources and inexperienced Mathematics teachers and many others.

2.2 Conceptual Framework

A conceptual framework is a model of presentation where researchers represent their relationship between variables in the study and show the relationship graphically or diagrammatically. According to Orodho (2009), conceptual framework assists the researcher to quickly see the proposed relationship between variables. Similarly, Sitko (2013) defined conceptual framework as the system of concepts, assumptions, expectations, beliefs, and theories that support and inform about the study. In this study, the conceptual framework would help readers understand the relationship between the independent and dependent variables. Figure 2.1 shows the conceptual framework of the study

Independent Variable



Source: Researcher's Construct, (2022)

Figure 2.1: Conceptual Framework of the Study

It could be seen from Figure 2.1 that the independent variable is made up of four perceived components that can contribute to poor academic performance of pupils in Mathematics. They are: student, teacher, home and school factors. Also, the dependent variable for the study is poor academic performance of pupils in Mathematics.

2.2.1 Student Factors

The researcher perceived that the pupils' negative attitude towards Mathematics can adversely affect pupils' academic performance in Mathematics. Also, the presence of indiscipline (for example, bullying among students, absenteeism/truancy, not taking part in class activities, exercises and assignments and many others) among pupils is likely to negatively influence the academic performance of pupils in Mathematics. On the contrary,

the absence of indiscipline among pupils is likely to positively influence the academic performance of pupils in Mathematics.

This affirms Allen-Meares, Washington and Welsh's (2000) assertion that poor students' attendance and irregularity resulting from avoiding classes by student, unexcused absence from school, leaving school premises without permission, tardiness, among others are major determinants of students' academic performance. Also, Farroq and Shah (2008) conducted a study on students' attitude towards mathematics in high schools in Pakistan. It was revealed by the study that students' success in Mathematics significantly depend on the attitude towards the subject. The study further showed that attitudes such as students' absenteeism, lateness and indiscipline affect academic performance in mathematics. In addition, students' self-concept is very important in the academic performance of students.

2.2.2 Teacher Factors

The researcher conceptualised that the presence of adequate teaching staff, high qualification of teachers, teachers' ability to prepare scheme of work and lesson notes, teacher punctuality and regularity, effective teaching, giving out exercises, marking them and discussing the outcome with students, healthy teacher-student relation and many others is likely to help improve the academic performance of pupils in Mathematics. However, the absence of these teacher-related factors in the school is likely to negatively influence the academic performance of pupils in Mathematics.

Also, the presence of regular in-service training for teachers, teacher motivation, cordial relationship among teachers and pupils, as well as friendly relationship between teachers and heads of schools is likely to help improve the academic performance of pupils in

Mathematics. However, the absence of these variables is likely to impede the academic performance of pupils in Mathematics.

This is in line with Mwnenda et al. (2013) who found that teachers' absenteeism, lateness and poor teaching methods contribute to the low academic performance of students. Likewise, World Bank (2004) found that teachers' lateness and absenteeism at the basic and secondary school levels in Ghana have been worsened over the last years leading to low academic performance of students.

2.2.3 Home Factors

The researcher perceived that low-income level of parents, parents' socio-economic status such as level of education, nature of occupation, poor home learning environment, and large family size is likely to influence the academic performance of pupils in Mathematics. For example, if the income level of parents is high, it is likely that parents would be able to provide the learning needs (buying of text books, paying of school fees and other school levies and many others) of the children. However, low-income level of parents is likely to negatively affect the financial responsibilities of parents towards their children.

Similarly, the presence of high educational background of parents is likely to have positive influence on the academic performance of pupils in Mathematics. This is so in the sense that, these parents are likely to guide their children in doing their homework; hence, involving themselves in the educational attainment of their wards. But, the presence of low educational background of parents is likely to negatively influence the academic performance of pupils in Mathematics. For example, these parents might not be able to assist their children to complete their homework.

Likewise, the nature of parents' occupation could influence the academic performance of pupils in Mathematics. For example, the presence of tight occupational schedule of parents may cause them not to be able to attend to the educational needs of their wards such as assisting them to complete their homework and attending school programmes. However, the absence of tight occupational schedule of parents is likely to cause parents to have more time for their children's educational needs. In this wise they could help them complete their homework, visit them at school to find out their academic progresses and so on.

This supports findings of Gorney (as cited in Adane, 2013) who established that family and environmental factors affect students' academic performance. Specifically, parents' expectation and attribution, structure of learning, the environment of the home, discipline and involvement of parent in the child's studies affect the performance of the student. Likewise, Schiller, Khmelkov and Wang (2002) conducted a study on economic development and the effects of family characteristics on Mathematics achievement in middle schools in 30 TIMSS nations. The results of the study showed that parents who have better education tend to provide academic and social support to their children as compared to less educated parents and hence, boost their academic performance.

2.2.4 School Factors

The researcher conceptualised that if the school environment is not conducive for learning (for example, excessive noise within the school environment) it may adversely affect effective teaching and learning in Mathematics. Further, if there is small class size, adequate school facilities (such as library, toilet, and classrooms), textbooks, teachers' manual, conducive learning environment and many others, is likely to contribute positively to academic performance of students in English language. However, the absence of school

facilities, large class sizes and many others is likely to contribute negatively to academic performance of pupils in Mathematics. However, the presence of effective school supervision, effective conflict management strategies of heads of school is likely to bring about high academic performance of pupils in Mathematics. But, the absence of effective school supervision, effective conflict management strategies of heads can bring about poor academic performance of pupils in Mathematics.

This affirms Lockheed and Verspoor's (as cited in Adane, 2013) argument that teaching and learning materials facilitate the instructional processes due to the fact that they provide information, help in the organisation of the scope and the sequence of the instruction and provide opportunities for the students to apply the concepts they have learned. Yinusa and Akanle (2008) also stressed that good sitting arrangement and good building of the school result in high academic performance of students whereas dilapidated school plants lacking conducive environment as well as no sitting arrangements can be destructive.

2.3 The Concept of Mathematics

The competence an individual gain in the study of Mathematics is generally used in all aspects of human life (Mensah et al., 2013). As indicated by Anthony and Walshaw (as cited in Mensah et al., 2013), Mathematics plays a quintessential role when it comes to shaping how individuals deal with their private, social and civil lives. Mathematics is seen by every society as the basis of scientific and technological knowledge that is very important in the socio-economic development of every nation (Mbugua, Kibet, Muthaa & Nkonke, 2012).

Mathematics as a subject has a direct relationship with other subjects that are technical and scientific in nature and thus, mathematics is seen as the bedrock for scientific, technological

and economic advancement of any country (Unameh, 2011; Tshabalala&Ncube, 2013). Mefor (2014) indicated that Mathematics and especially core Mathematics relates to everything in the universe which is connected to the daily life of the individual and thus, it is the subject humans cannot function meaningfully without. It must be pointed out that core knowledge in Mathematics holds the key to Africa's industrialisation and poverty alleviation (UNESCO, 1999).

From the Ghanaian perspective, Mathematics has been accorded the needed importance in the curriculum and content in all educational policies from the basic to the secondary level (Mereku, 2012). This is particularly important because, Mathematics aids in the development of basic computational skills and knowledge which consequently fosters the ability to be accurate in solving problems as well as doing further Mathematics (Sa'ad et al., 2014). A careful study of core Mathematics develops logical and abstract thinking skills, solve problems with related mathematical knowledge and expose the individual to creativity and curiosity in discovering solutions to their day-to-day problems (Sa'ad et al., 2014).

According to Akinyi (2003), Mathematics is very important in the sense that people working in the public and other sectors require some basic knowledge of Mathematics regarding their daily endeavours. It is in this regard that core Mathematics is a prerequisite subject of study in all tertiary institutions that offer scientific and business courses as well as a requirement for most employment opportunities (Akinyi, 2003). Looking at the relevance of Mathematics in the educational and the personal lives of individuals, it becomes worrying when students' performance is low.

Attitudes toward core Mathematics Attitude refers to a psychological tendency that is expressed through the evaluation of a specific entity with some degree of favour or

disfavour (Mensah et al., 2014). It particularly measures an individual's tendency to respond either positively or negatively to a certain idea, object, person and situation and thus, attitudes are generally positive or negative views about a person, place, thing or event which are often referred to as the attitude object which can influence individual's choice of action (Mensah et al., 2014).

It must be pointed out that some authorities are of the view that attitude towards core mathematics are just a like or dislike for the subject (Neale, 1969; Morris & Maisto, 2001). Others have theorised the meaning of attitude towards Mathematics as the beliefs, ability and usefulness of Mathematics (Zan & Martino, 2007; Hart, 1989). For instance, Zan and Martino (2007) have maintained that the attitude towards Mathematics can be seen as just the positive or negative emotional disposition towards Mathematics. On the other hand, Neale (as cited in Mensah et al., 2014) stressed that attitude towards Mathematics is seen as an aggregated measure of liking or disliking of Mathematics and thus, a tendency to engage in or avoid mathematical abilities, a belief that an individual is good or bad in Mathematics, as well as a belief that Mathematics is useful or useless influence a person's attitude. The attitude towards Mathematics and especially core Mathematics is characterised by how an individual associates emotion with Mathematics, his or her beliefs about Mathematics and how he or she behaves towards Mathematics, thereby making him or her to be anxious and fearful about Mathematics leading to low academic performance (Hart, as cited in Mensah et al., 2014).

It is therefore evident that the attitude towards Mathematics has cognitive, affective and behavioural components and thus, a teacher or a student can develop positive attitude towards Mathematics because he or she learns to associate positive experiences or events

with it which can affect students' academic performance. Particularly, the attitude towards Mathematics can be looked at from the perspectives of both the student and the teacher.

2.3.1 Students' attitude toward Mathematics

Studies have demonstrated that the attitudes, expectations, feelings and conceptions students exhibit with respect to the teaching and learning of Mathematics play a significant role in their performance (Borasi, as cited in Mensah et al., 2014). Generally, the attitudes or concepts students have about Mathematics consequently determine how these students approach the learning of the subject.

Mensah et al (2014) have noted that students' attitude toward Mathematics can be related to gender. For instance, Rhonda (1999) conducted a study on gender differences in students' attitudes towards Mathematics in the Randolph County Public High School graders in rural southwest Georgia, United States of America. The sample for the study was 1171 students who were selected through simple random sampling procedures. Mathematics attitude scale was used to measure the attitudes of students in Mathematics and independent t-test was performed to know whether a difference exists in males and females' attitude in Mathematics. The result of the study revealed that, in all grades, except the second grade, females' attitudes in Mathematics were better than males and thus females performed males.

On the other hand, Mutai (2011) conducted a study on gender differences in Mathematics attitudes and performance among secondary school students in Bureti sub-county in Kericho County in Kenya, with a sample of 430 students and 18 teachers who were selected by using the stratified and purposive sampling procedures respectively. The study used teachers' questionnaire, Mathematics attitude inventory and Mathematics test to gather

data. Pearson Product Moment and independent t-test were used to analyse the data that was gathered. The result of the study uncovered those boys had a stronger affinity, attitudes and interest towards Mathematics. From works of Rhonda (1999) and Mutai (2011), in cases where there is the idea that males perform better in terms of their attitudes than females or the vice versa, the performance of females or males who might want to do Mathematics will be affected which will also influence their attitudes towards Mathematics.

A study was conducted by Farroq and Shah (2008) on students' attitude towards Mathematics in high schools in Pakistan with a sample size of 685 private and public 10th grade students who were selected through convenience sampling. The data were analysed with t-test and it revealed that students' success in Mathematics significantly depend on the attitude towards the subject. It was further revealed that as compared to males, females lacked the confidence in Mathematics. A study by Mensah et al. (2013) has shown that there is a positive correlation regarding students' attitude in Mathematics and their academic performance. According to the work of Mensah et al. (2013) which focused on senior high school students' attitude towards Mathematics and performance in Ghana with a sample of 100 students and 4 Mathematics teachers who were randomly selected, it was revealed that a weak positive correlation existed between teachers and students' attitude toward Mathematics. From the views of Mensah et al. (2013) and it can be observed that the kind of attitude that is exhibited by both teachers and students is critical in students' academic performance in Mathematics.

2.3.2 Teachers' attitude towards Mathematics

Teachers' attitude regarding the teaching of Mathematics tends to affect how well the students will perform in the subject. Positive attitude of teachers towards Mathematics is

significantly related to high academic performance (Mensah et al., 2013). From the work of Mensah et al. (2013) which focused on senior high school students' attitude towards Mathematics and performance in Ghana with a sample of 100 students and 4 Mathematics teachers who were randomly selected, it was revealed that if teachers exhibit positive behaviour and give good utterances about Mathematics, students would imitate that behaviour and hence develop positive attitude towards the study of Mathematics. With respect to the attitude of teachers toward Mathematics, Clarke, Thomas and Vidakovic (2009) indicated that teachers' attitude towards Mathematics can be measured in emotional and cognitive behaviours. In this regard, attitudes and practices of teaching Mathematics as a teacher are influenced by beliefs, emotions, content knowledge as well as social context.

According to Henderson and Rodrigues (as cited in Mensah et al., 2013), emotional responses toward Mathematics that are found in teachers include like and dislike for Mathematics, anxiety associated with Mathematics and self-confidence regarding Mathematics. In this sense, Burks, Heidenburg, Leoni and Ratliff (as cited in Mensah et al., 2013) stressed that teachers' exhibition of self-confidence during Mathematical lessons motivates student to performance higher in Mathematics. Specifically, students draw from the teachers' disposition in forming their own attitude which may affect their learning outcomes in Mathematics. In essence, attitude such as the usefulness of Mathematics, the way core Mathematics is taught and learned, the difficulty or ease of Mathematics, as well as gender ability and beliefs also affect teachers' attitude towards the subject which impact on students' academic performance (Mensah et al., 2013).

Notably, the teacher can develop positive attitudes towards Mathematics that can help to build students' confidence. In accordance with the Ontario's Ministry of Education (2004), this can be done by encouraging the belief that everyone can do core Mathematics, addressing the learning styles of students by providing a variety of ways for students to gain an understanding of difficult concepts, helping students to appreciate the value of Mathematics in their lives and choosing activities carefully so that students can be challenged and successful.

2.4 The Concept of Academic Performance

Academic performance can be viewed as a successful attainment or accomplishment in a specific subject area which include the assignment of grades, marks and scores aimed at describing a trait possessed by students (Dimbisso, 2009). As indicated by Ferla, Martin and Yonghong (2009), academic performance depicts an individual's knowledge and perception he or she possesses with respect to his or her academic capability in performing successfully a given academic task at a designated level. The concept of academic performance can therefore be likened to a stable judgment about an individual's perceived ability in a specific academic domain or a given academic task (Ferla et al., 2009).

Kobaland and Musek (as cited in Adane, 2013) emphasised that academic performance of students can be more objective due to the fact that numerous scores are assigned to students' learning outcomes. This is done to measure the degree of students' adaptability in the entire educational system. On the other hand, the fact that academic success depends on the students' attitudes towards their academic achievement and themselves and attitudes of significant others towards their success and themselves, academic performance can be subjective (Adane, 2013). Academic performance of students in Mathematics can be high

or low. For the purpose of this study, the emphasis is laid on low academic performance which has been shown to be demonstrated in the performance of pupils in Mathematics in the Hohoe Municipality.

As indicated by Diaz (2003), low academic performance refers to a situation where subjects are unable to accomplish the expected abilities regarding a chosen domain which consequently affects their personality and entire life. Similarly, Aremu (2005) noted that low academic performance specifically describes a situation where the performance of the examinee falls below the expected standard which is set by the evaluator of the performance.

2.4.1 Academic Performance of Pupils in Mathematics at the Basic School Level

At the Junior High School level in Ghana, studies have indicated low academic performance of basic school pupils in Mathematics (Mills & Mereku, 2016; Mereku, 2012). The low academic performance comes as a result of some difficulties which have been identified by various scholars. One of such difficulties can be attributed to the developments of school Mathematics over the years (Mereku, 1999). It should be acknowledged that the development of the canonical school curriculum for Mathematics inhibits any teacher who is of the view that modern Mathematics came to replace the old Mathematics and as such, such teachers may continue to devote a considerable time in treating topics like sets, numeration system, integers and rational numbers to the neglect of those topics that involve real life applications.

It has been established that teachers at the Junior High School level are likely to find it difficult to cope with the teaching of some of the modern syllabus for years II and III leading to the skipping of some of the topics in the syllabus (Mereku, 1999.) Gleaning from

above, in cases where some topics are skipped because teachers are unfamiliar with content at the basic level coupled with other factors, pupils are faced with a conceptual gap regarding their abilities to understand the concepts at the secondary level. This particularly affects the foundation of the students according to the rationale of the Senior High School core Mathematics teaching syllabus.

In actual fact, school Mathematics is now being linked with every life of the pupils, thus, they are to gain practical knowledge at the basic level and progress to the secondary level for better understanding of Mathematics (Curriculum Research and Development Division, 2010). It is worth noting that, mathematics at the Junior High School level is very important. This is because, the knowledge pupils gain at the basic level in Mathematics serves as the basis to develop the required Mathematical understanding and competencies which consequently enhance their academic performance. This allows the pupils to use their knowledge in solving real life problems and become equipped to enter into further studies and associated vocations in Mathematics, science, commerce, industry and a variety of other professions (Curriculum Research and Development Division, 2010).

The issue of low academic performance at the Junior High School level in Ghana therefore becomes critical because of the assumption that the low academic performance creates the impression that the foundation of the pupils is weakened. In the case of the Ghanaian Junior High Schools, pupils' performance in Mathematics as indicated by various reports from the Basic Education Certificate Examination show that the academic performance of pupils in numeracy over the years is quite low or leaves much to be desired (Mereku, as cited in Mills & Mereku, 2016).

As indicated by Anamuah-Mensah, Mereku and Asabere-Ameyaw (as cited in Mills & Mereku, 2016), the general performance of Ghanaian students on Trends in International Mathematics and Science Study (TIMSS) for Mathematics test has been low. It was revealed that Ghana obtained low mean scores of 276 in mathematics thereby placing the nation last but one among 46 participating countries (Mills & Mereku, 2016). It must be stressed that, over the years, the performance of students and especially Junior High School students in Ghana has been the lowest as compared to other African countries (Mills & Mereku, 2016). It was brought to light that, pupils' inability to reach the higher benchmark necessitates the need to assist pupils to build a grounding in the mastery of fundamental knowledge and skills that are needed to solve demanding problems.

Considering the performance of Junior High School students in Ghana, Mills and Mereku (2016) explained that, in Mathematical abilities, Ghanaian pupils normally obtain the lowest scale scores. Specifically, the scores are as range from 130 and 430 which are below the average scale score of 500 and 800 in TIMSS examination (Mills & Mereku, 2016). This is not surprising because, it has been noticed at the basic level by Mereku (2012) that, Mathematics lessons follow a similar pattern. The sequence of presentation generally followed was that teachers always led the class discussions that used familiar situations and examples, followed by pupils' examples and exercises. According Mereku (2012), when teachers fail to use effective teaching materials but rely solely on textbooks and routine tasks, the interest of the students is minimised which hinder the conceptual and practical understanding of the pupils in Mathematics. The end result of the lack of conceptual and practical understanding is low academic standards in pupils' performance.

2.5 Empirical Review

This subheading is discussed under four thematic areas: Pupil, teacher, home and school factors.

2.5.1 Pupil Factors

Numerous factors on the part of students have been uncovered as influencing their academic performance. Prominent among these factors particularly include time spent with books and homework, lateness and absenteeism, regularity at school, language use and enjoyment of lessons. Other factors include, students' perception about the subject, self-concept, motivation, health and nutritional status of the student (Engin-Demir, 2009; Adane, 2013). As revealed in the study by Engin-Demir (2009) which focused on the factors influencing the academic achievement of poor urban primary school students in Turkey with a sample size of 719 sixth, seventh and eighth graders who were selected through simple random sampling procedures, irrespective of how intelligent a student was, students who devoted more time regarding their assignment and homework tend to improve on their grades which boost their academic performance.

Gleaning from the finding by Engin-Demir (2009), the amount of time students devotes in doing his or her assignments increases their motivation and interest. It is in this regard that a survey by Fraser and Kahle (2007) which focused on examining classroom, home and peer environment influences on student outcomes in science and Mathematics in Tunisia, using a sample of 7,000 students who were selected through simple random sampling procedures revealed that homework tends to depict a positive relationship with respect to learning outcomes of students and that there is the need to extend classroom learning to include giving homework to students.

An explanation to the positions of Fraser and Kahle (2007) is evident when the given assignment is relevant to learning objectives, measured regularly and the necessary feedback has been given. In this sense, a study was conducted by Alomar (2006) on the personal and family paths to pupils' achievement in the United States of America. A sample size of 751 eighth grade pupils who were selected through simple random sampling procedures. The results of the study showed that assignment served as an interaction between the school and home which plays a central role measuring the academic performance of the students. Moreover, students' attendance and regularity in class have the tendency of influencing their academic performance. As theorised by Allen-Meares, Washington and Welsh (2000), poor students' attendance and irregularity resulting from avoiding classes by student, unexcused absence from school, leaving school premises without permission, tardiness, among others are major determinants of students' academic performance.

An observation of the assertion by Allen-Meares et al. (2000) makes it clear that student's academic performance is negatively related to working during school hours. This is evident in the study conducted by Engin-Demir, Demir and Uygur (2006). The study by Engin-Demir et al. (2006) focused on examining the relationship between work, school performance and school attendance of primary school children in Turkey. A sample of 652 children who are engaged in menial jobs after school and 423 children who were not engaged in any job from 23 schools in urban areas of the capital-Ankara were selected through cluster sampling procedures. The study revealed a significant difference in the school performance and school attendance of the two categories of students as identified. It was further revealed that test scores and attendance of working children were lower than non-working children.

From the findings of Engin-Demir et al. (2006), it can be inferred that an increase in the working hours in school tend to decrease the academic performance of students and the vice versa. Students' attitude which include absenteeism, indiscipline and truancy among others, also influence their academic performance. For instance, Farroq and Shah (2008) conducted a study on students' attitude towards mathematics in high schools in Pakistan. The study used a sample size of 685 private and public 10th grade students who were selected through convenience sampling procedures. It was revealed by the study that students' success in Mathematics significantly depend on the attitude towards the subject. The study further showed that attitudes such as students' absenteeism, lateness and indiscipline affect academic performance in mathematics. In addition, students' self-concept is very important in the academic performance of students.

A study conducted by Diaz (2003) on the personal, family and academic factors affecting low achievement in secondary schools in Almeria, Spain, with a sample of 1178 students from four secondary schools, who were selected through stratified sampling procedures revealed that students' self-image about a specific subject facilitates his or her acceptance, rejection or interest and further motivates him or her do well in the subject and thus, self-image is a considerable factor in students' academic performance. Help with studies at home affects students' academic performance and this was evident in Etsey's (2005) study on causes of low academic performance of primary school pupils in the Shama Sub-Metro of ShamaAhanta East Metropolitan Assembly (SAEMA) in Ghana.

The study by Etsey (2005) showed that help with studies and homework supplement what is learnt in schools making those who are exposed to such aids perform high. In addition, Etsey (2005) asserted that students' academic performance tends to be high when they enjoy the teachers' lessons. It was revealed by Etsey (2005) in his study that students in

high achieving schools enjoyed their teachers' lesson and factors accounting for this included commitment to teaching, adequate teaching and learning materials and teachers' professionalism. It can be concluded that in situations where these attributes are low, students' performance is hindered and thus, the study seeks to find evident if some of these pupil factors are perceived to have contributed to poor academic performance of JHS pupils in Mathematics over years in the Hohoe Municipality.

Studies conducted internationally have revealed that learner-centred factors that cause poor performance in Mathematics among senior secondary schools include learners' misconceptions about Mathematics as a difficult subject, and fear and anxiety (Asikhia, 2010). Hlalele (2012) stated that "students often develop Mathematical anxiety in schools, often as a result of learning from teachers who are themselves anxious about their Mathematical abilities in certain areas". In the South African context, research by Makhubele and Luneta (2014) indicated that learners' inferior performance in Mathematics is influenced by their negative attitudes towards the subject that emanate from societal views that it is a difficult subject.

Also, a study conducted by Zadoo and Rana (2016), came up with the finding that study habits and academic performance are possibly correlated. Hadi and Al-Ommar (2015) while studying about different factors contributing academic performance, found out that student level variables (prior achievement and self-concept) were more important than school level factors (school gender, number of students in school, and teacher's satisfaction).

According to Effandi and Normah (2016), a student needs to think and make decisions using appropriate strategies to solve Mathematical problems. They added that students'

success in achieving their goals encourage them to develop positive attitudes towards Mathematics and other problem solving activities. Willingness to solve mathematical problems compared to average and weak students. Students' commitment in Mathematics refers to students' motivation to learn Mathematics, their confidence in their ability to succeed in mathematics and their emotional feelings about Mathematics. Students' commitment in Mathematics plays a key role in the acquisition of math skills and knowledge (Education Matters, 2015).

According to Effandi and Normah (2016), students' attitudes towards Mathematics are very much related to their attitude towards problem solving in general. They added that negative attitudes need to be overcome, so that later in life, students will not suffer from poor problem-solving skills. It is important to master problem solving skills as these skills are essential for dealing competently with our everyday life. Therefore, students' interest in Mathematics is believed to play a significant role in Mathematics performance and might be one of the factors that influence students in Mathematics performance.

Further, Enu, Agyeman and Nkum (2015) surveyed factors influencing students' Mathematics performance in some selected Colleges of Education in Ghana. The study was quantitative in nature. Also, descriptive survey design was adopted in the study. Three Colleges were randomly selected for the study. A total of 50 students from these Colleges of Education participated in the study. Data for the study was collected through student's questionnaire. The findings revealed that students' self-motivation influences academic performance of students in Mathematics.

Students' attitude towards Mathematics influences the efforts they put in understanding and practising mathematical concepts and skills. According to the National Research

Council, as cited in Akey (2016), students' beliefs about their competence and their expectations for success in school have been directly linked to their levels of engagement, as well as to emotional states that promote or interfere with their ability to be academically successful. Thus, attitudes determine the effort a student is likely to put in his learning of the subject (Mathematics). It is therefore necessary for Mathematics teachers to strive and sustain positive attitudes towards Mathematics for good performance in the upper classes (Benson, 2012).

Again, Isack (2015) examined factors leading to poor performance in Mathematics subject in Kibaha secondary schools. The study involved 4 secondary schools, 8 mathematics teachers and 60 students. These were obtained through simple random sampling. Four academic masters and four head of school from four schools were purposely selected. Data collection was done by using questionnaires, interviews, focus group discussions, observations and documentary review. The findings indicated teaching and learning of Mathematics was facing challenges such as inadequate self-practice among students and students' poor background in Mathematics. Therefore, the researcher recommended that teachers should assess the background of students in to decide teaching methods that can help students perform better in Mathematics. Moreover, students should put self-efforts and practice in learning Mathematics. Lastly, the researcher recommended future research on individual factors that affects students' learning of Mathematics.

Tshabalala and Ncube's (2013) study revealed that student's performance in Mathematics was mainly affected by students' grounding in the subject at lower levels as well as their fear of the subject. The mediating variables such as students' attitudes towards Mathematics, perceived importance of Mathematics and students' time spent on Mathematics homework were influential predictors of student's academic performance in

Mathematics. Again, several factors had been identified which seems to be the reason for student's underachievement in Mathematics (Suan, 2014). Suan (2014) found that student factor like study habits, time management, attitude and interests towards Mathematics.

Asamoah (2018) examined perceived causes of low academic performance of senior high school students in core Mathematics in the Kumasi Metropolis. The study used the descriptive survey design with quantitative approach. Multi-stage sampling procedures were used to select a sample of 439 respondents which included 381 students and 58 core Mathematics teachers. Students and teachers' questionnaires were used to collect data for the study. Means and standard deviations were used to analyse the data that was gathered. The study further revealed student-related factors such as student lateness and absenteeism, students being unhappy in core Mathematics classes, low self-esteem and poor attitudes toward core Mathematics as contributors to the low performance in core Mathematics.

2.5.2 Teacher Factors

Several factors emanating from the teacher such as attendance in school, interest in students' understanding and motivation, effectiveness of teaching, methods of teaching, use of language, completion of syllabus, preparation of lesson notes, mastery of content and others affect the performance of students (Etsey, 2005; Mbugua et al., 2012; Mwenda et al, 2013). From the work of Mwnenda et al. (2013), teachers' absenteeism, lateness and poor teaching methods contribute to the low academic performance of students. The study by Mwenda et al. (2013) focused on factors contributing to students' poor performance in Mathematics in public secondary schools in Tharaka South District, Kenya. The study used the descriptive survey design with a sample of 248 respondents who were selected through stratified and proportionate sampling procedures. The result of the study showed that

teachers' absenteeism and lateness contributed to low academic performance of students. According to the World Bank (2004), teachers' lateness and absenteeism at the basic and secondary school levels in Ghana have been worsened over the last years leading to low academic performance of students.

The study by World Bank (2004) was a national survey across Ghana, which was conducted in collaboration with the Ghana Statistical Service and the Ministry of Education, Youth and Sports. It sought to evaluate school buildings, availability of books and learning outcomes. By using the mixed method approach, data were obtained from the central government, local governments, school management, teacher morale and methods, enrolment, learning outcomes and school building from over 50 secondary and basic schools for a period of 15 years. The results of the survey showed that absenteeism (both teachers and students) was worse in rural schools than in urban schools and worse in public schools compared to private schools and thus, affecting students' academic performance. It was further revealed that factors such as long distance, difficulty in accessing salaries, farming activities, poor working conditions, low morale and high students-teacher ratio, and transportation difficulties also lead to teacher absenteeism.

In addition, a study conducted by Wekesa (2010) which focused on assessment of factors affecting students' performance in Mathematics at secondary school level in Kenya, with a sample size of 4,500 students, 60 teachers and 150 principals who were selected through stratified sampling techniques revealed that teachers' experience, lateness and absenteeism affect students' academic performance in Mathematics. The finding of Wekesa (2010) is obvious because, when teachers are late, the teaching and learning processes are also delayed which affect learning outcomes of students when they happen consistently. From a survey by Adane (2013) which sought to identify factors that are responsible for the low

academic achievement of pupils in Kemp Methodist Junior High School at Aburi in the Eastern region of Ghana, with a sample of 120 pupils, 31 teachers and 120 parents who were selected through multi-stage sampling procedures revealed that lateness ranging from five minutes to one and half hours affect pupils' academic performance.

Anane's (2015) study found that teachers adjusted the sequence of their curriculum based on what is included in high stake tests like West African Secondary School Certificate Examination (WASSCE) in order to improve tests scores. In this sense, there is the likelihood that vital aspects in the syllabus that do not appear on test are ignored which contributes to lack of completion of the said syllabus (Anane, 2015). This results in most students' inability to follow and monitor the school's work due to the fact that they do not have the understanding from previous work which is a prerequisite for the syllabus regarding higher grade levels. Another perceived teacher's factor as affecting students' performance is motivation and interest. It is obvious that an individual who exhibits a high sense of motivation puts his or her maximum effort in the employment he or she finds him or herself.

The finding of Adane (2013) affirm that of Etsey (2005) on causes of low academic performance of primary school pupils in the Shama Sub-Metro of ShamaAhanta East Metropolitan Assembly (SAEMA) in Ghana. The study by Etsey (2005) used a causal-comparative (ex post facto) in which 25 primary schools which included 15 Shama sub-metro schools and 10 SAEMA high achieving schools with a total of 495 pupils, 25 head teachers, 133 teachers who were randomly selected and 581 parents who were interviewed. The findings of the study showed that when syllabi are not completed, students usually find it very tedious to understand the content to be communicated especially in the next grade level because educational processes occur in a continuum. A notable contribution to the

lack of completion of the syllabus is adjusting the curriculum based on what is included in high stake test in order to improve test scores.

In this regard, Ofoegbu (2004) theorised poor academic performance of students as relating to poor teachers' motivation in accordance with teaching task, negative attitude toward work and poor teaching habits which lead to poor motivation. In this regard, lack of motivation and low professional commitment by teachers stand the chance of producing poor attendance and unprofessional attitudes regarding students, teaching and learning process which will consequently affect students' academic performance (Etsey, 2005). Moreover, effective teaching and subject matter knowledge as demonstrated by the teacher have been underscored in literature as influencing students' academic performance (Enu et al., 2015).

From the work of Enu et al. (2015) which focused on factors influencing students' Mathematics performance in some selected colleges of education in Ghana in which a sample size of 50 students were selected randomly revealed that teachers' knowledge and bad method of instruction affect students' performance in mathematics. It must be pointed out that although the sample size for the study was small to have generalised the findings but it is very obvious that the quality of teachers and the commitment they portray are essential regarding the achieving of high students' academic performance. Agyeman (as cited in Adane, 2013) noted that teachers who do not possess both academic and professional qualification in teaching would have a negative influence on the teaching and learning of their subject area. This suggests that teachers' knowledge of the content or subject matter as well as availability and adequacy of textbooks, time and other learning materials are influential regarding the learning of the students (Lockheed & Verspoor, as cited Adane, 2013).

Certain quality characteristics such as certification and qualifications in the subject to be communicated are very important and they positively relate with the outcomes of students especially in mathematics and science (Darling-Hammond, 2000). A survey was conducted by Darling-Hammond (2000) on teacher qualifications and other school inputs that were related to students' achievement in the United States of America. The study used a total of 50 schools between the years of 1993 and 1994 who were selected randomly. The study revealed that teacher preparation and certification were the strongest correlates of student achievement in Mathematics.

Similar to the finding of Darling-Hammond (2000), a study was conducted by Abuseji (2007) on student and teacher related variables as determinants of secondary school students' academic achievement in Chemistry in Pakistan. The study used a sample size of 321 Form two senior high school students and 98 teachers who were selected through simple random and stratified sampling procedures. The results of the study showed that teachers with higher academic qualification possess more content and subject matter knowledge in high quality teaching skills such as feedback, questioning, explaining things clearly to students.

As part of the teacher-related factors, according to a study by Etsey (2005) which focused on causes of low academic performance of primary school pupils in the Shama sub-metro of ShamaAhanta East Metropolitan Assembly (SAEMA) in Ghana with a sample of 495 pupils, 25 head teachers, 133 teachers who were randomly selected and 581 parents interviewed revealed that the use of language and especially the local language as a medium of instruction created deficiencies in the students which make them unable to understand the textbooks they needed to use. This is because, the text books that are used by the pupils are written in English and in cases where the local language is used as a medium of

instruction, it creates deficiencies in student's understanding which consequently results in low academic performance. In addition, understanding of the lesson as well as completion of syllabi are linked with output and outcome and thus, in cases where the teacher is not interested in the understanding of concepts by students or inability of the teacher to complete the syllabi leads to low academic performance (Etsey, 2005).

Research by Cascio (2013) found that educators play a significant role in learners' school performance; for example, if the educator lacks experience or passion about teaching, the learners might not be able to develop comprehensive understanding of the subject material. It is further assumed that, if the educator does not have effective classroom management skills and applies extreme authoritarianism, the classroom environment might hinder fruitful class discussions and collaborative learning from learners. It can also deter learners from applying themselves to the best of their abilities.

It is therefore clear from the existing research that educators have an impact on the deficient performance in mathematics because if the teacher does not have a good subject knowledge and pedagogical content knowledge s/he might deliver incorrect content or even skip content, which could also lead to poor performance (Asikhia, 2010). Another factor is the language of teaching and learning. Educators tend to use learners' home language during teaching and learning so that learners often fail to understand the language used in the official examination papers and consequently fail to answer correctly (Asikhia, 2010).

Forrest et al. (2019) argue that in South Africa the quality of teachers, influences learners in learning Mathematics. According to Chen, Wei and Jiang (2017) strong evidence exists showing that teacher diligence, dedication, and adherence to basic educational policies and processes can lead to good teaching and learning. Chen, Wei and Jiang (2017) further assert

that issues around the maximisation of contact time with learners in class, and the presence of both learners and teachers at school and in class, have a positive impact on performance.

Additionally, Enu, Agyeman and Nkum (2015) investigated factors influencing students' Mathematics performance in some selected Colleges of Education in Ghana. The findings revealed that lecturer method of instruction was a key factor which affected students' performance. The study also revealed that teachers' self-motivation also influences academic performance of students in Mathematics. Besides, Etsey's (2015) study revealed that lack of motivation and professional commitment produce poor attendance and unprofessional attributes towards students which in turn affect the performance of students academically. More so,

According to Secondary Education Development Programme [SEDP] I (2014), generally there had been low quality of schooling outcomes with over 66% failing. This was associated with overloaded curriculum, weak teacher qualifications and teaching abilities of some of the Mathematics teachers. Besides, Tshabalala and Ncube's (2013) study revealed that student's performance in Mathematics was mainly affected by teaching methods Mathematics teachers adopted and teacher behaviour.

In furtherance, Iheanachor (2014) investigated the influence of teachers' background, professional development and teaching practices on students' achievement in Mathematics in Lesotho. It was found that there was a positive association between students' performance in Mathematics and teaching methods in Mathematics. Iheanachor's (2014) findings further revealed that teaching methods, teacher qualifications, subject majors and the years of experience are predictors of students' achievement in Mathematics. The study again revealed that some Mathematics teachers have majored in Mathematics or

Mathematics education and others have majored in professions other than Mathematics but employed to teach Mathematics. This implies that almost half of the Mathematics teachers may not have enough Mathematics knowledge and skills that affects their teaching methods.

Several factors had been identified which seems to be the reason for student's underachievement in Mathematics (Suan, 2014). Suan (2014) found that teacher factor, such as teaching styles, mastery of the subject matter, instructional techniques and strategies, classroom management, communication skills, and personality. Again, Suan (2014), as she cited from Hill, Rowan & Ball (2005), and Quimbo (2003), observed that teachers who have mathematical knowledge, good attendance and participate in programmes development have the students with good performances in Mathematics.

Ali, Altcher and Khan (2010) came out with findings that problem-solving method could help students perform better in Mathematics than those taught by traditional method. The methods exposed students to take responsibility of their own with the teacher acting as the facilitator. This resembles to what Mtitu (2014) termed as learner centred teaching. Kita (2014) explored a number of factors that consistently affect performance in Mathematics among ordinary level secondary school students in Tanzania. These were such as schools being occupied by unqualified and under qualified teachers that had problems with pedagogical content knowledge and teaching skills.

According to Kafyulilo, Innocent and Ikupa (2012), in their study done at Mbeya, they found that, teachers claimed to have high ability to implement competency-based teaching. Teachers were able to properly state the competency based objective and able to properly state the teachers' activities, students' activities and assessment plans. But their conclusion

was that competency-based teaching approaches were not well implemented in Tanzania schools and teachers have limited ability to demonstrate it. This showed that competency based teaching approach is superficially implemented and hypothetical rather than practical to the extent students fail examination in important subjects like basic Mathematics.

Asamoah (2018) also found that teacher-related factors such as teacher lateness and absenteeism, inability of teachers to complete their syllabus and prepare their lesson notes contributed to the low academic performance in core Mathematics. Also, Mefor (2014) has noted that teachers who do not possess the required academic and professional qualifications would consequently have a negative influence regarding the teaching and learning of their subjects. It was further stressed that, teachers who possess the required academic and professional qualification but work under unfavourable terms and conditions would be less dedicated to their work and become less productive than unqualified teachers who work under favourable conditions and terms of service which will consequently affect students' academic performance (Tshabalala&Ncube, 2013).

2.5.3 Home Factors

It is an undeniable fact that the way a student performs can be influenced by a variety of factors from the home. Prominent among these factors are the socio-economic status which include education, occupation and income, size of household, type of discipline at home, structure of family and parental involvement as well as interest in child's schooling (Adane, 2013; EnginDemir, 2009). As indicated by Gorney (as cited in Adane, 2013), family and environmental factors affect students' academic performance. Specifically, parents' expectation and attribution, structure of learning, the environment of the home, discipline and involvement of parent in the child's studies affect the performance of the student.

Schiller, Khmelkov and Wang (2002) conducted a study on economic development and the effects of family characteristics on Mathematics achievement in middle schools in 30 TIMSS nations. A sample of 219,402 students from 7th and 8th grades were selected through stratified, cluster and proportionate sampling procedures. The results of the study showed that parents who have better education tend to provide academic and social support to their children as compared to less educated parents and hence, boost their academic performance. A notable explanation to the findings of Schiller et al. (2002) in my view is that parents who are educated understand the need to educate their children because of the benefit they (parents) have had in their education. This was justified by Johnson and Kyle (2001) in their study. The survey by Johnson and Kyle (2001) used a sample of 3,192 households and 14,924 individuals as well as 6, 719 children who were selected through cluster sampling procedures across Ghana. The findings of the survey showed that educational status of parents was a major factor as contributing to the students' academic performance. Specifically, mother's education has been justified in literature as having a significant influence on the students' academic performance (Johnson & Kyle, 2001).

In addition, parents' occupation has been noted to have substantial effect on reading and Mathematics test scores (Fuchs & Woessmann, 2004). In the work of Fuchs and Woessmann (2004), a sample of 57 countries who participated in TIMSS and PISA examinations in mathematics were randomly selected. The study revealed that, parents' occupation and more specifically having a full-time employment significantly affect academic performance. Furthermore, higher family income is related to higher academic performance.

A study by Asikhia (2010) which examined the perception of students and teachers on the causes of poor academic performance among secondary school students in Ogun State,

Nigeria, in which a sample of 135 students and 50 teachers were randomly selected from five secondary schools revealed that students from poor homes are often dropped out from school and consequently engaged in hawking, selling, and many others in order to save money for their educational expenses. This led to the inability of the student to afford instructional materials and other educational needs thereby affecting their academic performance. It is in this regard that Yinusa and Akanle (2008) in their study in Nigeria with a sample of 120 students who were selected through simple random sampling procedures concluded that insufficient parental income influences students' academic performance. It should be indicated that the number of siblings of students tends to influence the academic performance of the student.

Asikhia (2010) in his study on the perception of students and teachers on the causes of poor academic performance among secondary school students in Ogun State, Nigeria, revealed that the larger the family size, the less the attention and devotion children receive from their parents. The findings of Asikhia (2010) confirm Downey's (1995) study on family size, parental resources and children's educational performance in Ohio, United States of America. The study by Downey (1995) was a national longitudinal survey which used a sample of 24, 599 eighth graders who were selected through simple random sampling procedures. The study revealed that children who come from large family sizes have less favourable home environments leading to lower levels of educational performance and attainment and the finding confirm the position of Asikhia (2010). Moreover, parental discipline has been noted to affect the performance of students.

A study was conducted by Steinberg, Lamborn, Dornbusch and Darling (1992) on the impact of authoritative parenting, parental involvement in schooling and parental encouragement to succeed on adolescents' school achievement in Mathematics and English

at the high school level in Northern California. The sample for the study was made up of 6,400 students who were selected through random sampling procedures. The findings of the study revealed that authoritative parenting leads to better adolescents' performance and strengthens school engagement while democratic style weakens the beneficial impact of parental involvement in schooling on adolescent achievement.

Attwood (2014) attributes poor performance in Mathematics to parental attitude and interrupted teaching. Karue and Amukowa (2013) found that home environmental factors and family backgrounds as well as little participation of parents in the education of their children were the main causes of poor performance in Mathematics in Kenya. Cascio (2013) found family-related factors also play a critical role in learners' performance. Parents who are too occupied to care about their children's performance contribute to children losing their academic focus. Poverty-stricken families were found to negatively affect their children's academic performance. Some parents were found to be abusive, which caused learners' school performance to decline dramatically. Learners who come from abusive families tend to perform badly at school (Cascio, 2013). Likewise, Considine and Zappala (2012) argue that families where the parents are advantaged socially, educationally and economically foster a high level of achievement in their children. Again, Asamoah's (2018) study did not show any home-based factors as contributor to the low academic performance in core Mathematics.

According to Smith (2014), family background influences student performance in Mathematics, it is identified that students' cultural backgrounds differ and can affect students' influences to study Mathematics. Furthermore, students from different cultural backgrounds are influenced differently based upon parental experiences, interests in mathematics and cultural views and attitudes of Mathematics education. Additionally,

Smith's (2014) study indicated that students who are studying higher-level Mathematics are influenced differently as compared to students who are studying lower level Mathematics or chose not to study Mathematics at all.

One of the most stable and consistently observed phenomena in the field of education is the impact of students' home background on achievement (Sirin, 2015). Students whose parents have a higher level of education, a more prestigious occupation, or greater income tend to have higher achievement than students whose parents have a lower standing on such socio-economic status indicators (Sirin, 2015).

Again, Limb and Fullarton's (2012) study in United States of America and Australia on Trends in International Mathematics and Science Study (TIMSS) found that students with more family cultural resources such as books at home and those from two parent rather than single parent families tend to have higher performance levels in Mathematics. Students from English speaking families have good performances in Mathematics than non-English speaking families. In classes where teachers set more homework they have associated with higher levels of performance. They supported that grouping practices employed by teachers shape the classroom learning environments and improve students' performance.

2.5.4 School Factors

As indicated by Mwenda et al. (2013), school environmental factors denote how the quality of the physical environment and facilities as well as the perceptions students have about their school have an influence on their academic performance. The factors include the availability of teaching learning materials, location of the school, the quality of the physical facilities class size, teacher to student ratio, qualification of teachers, teachers' experience

and supervision. The school environment factors also include preparation and vetting of lesson notes, organisation of in-service training and regular staff meetings, among others (Etsey 2005; Mwenda et al., 2013).

Lockheed and Verspoor (as cited in Adane, 2013) maintained that teaching and learning materials facilitate the instructional processes due to the fact that they provide information, help in the organisation of the scope and the sequence of the instruction and provide opportunities for the students to apply the concepts they have learned. This suggests that in cases where one or more of these factors identified is/are missing in the school environment, students' learning will be affected negatively and consequently affect students' academic performance. It is evident that students exhibit a good performance when they have adequate instructional materials or aids (such as textbooks, teachers' guides, pictures, etc.) that will facilitate their learning and teaching processes (Adane, 2013). In essence, the availability and adequacy of the use of these teaching and learning materials significantly affect the effectiveness and the efficiency of the teacher's lessons regarding the subject he or she teaches.

Adane (2013) and Mwenda et al. (2013) posited that the location of the school and the quality of the school tend to influence the performance of students. This is because, the location of a school specifically determines the patronage of students and the general attractiveness of physical facilities and structure of the school building can demotivate the learners which may lead to low patronage in school activities (Asikhia, 2010). It is in this sense that Yinusa and Akanle (2008) stressed that good sitting arrangement and good building of the school result in high academic performance of students whereas dilapidated school plants lacking conducive environment as well as no sitting arrangements can be destructive.

A study was conducted by Engin-Demir (2009) on factors that influenced the academic achievement of poor urban primary school students in Turkey. The study used a sample size of 719 respondents which included sixth, seventh and eighth graders who were selected through simple random sampling procedures. The study revealed that attending a school with a good and better school environment or facility is positively related and associated with increased mathematics scores. It can therefore be concluded from the finding of Engin-Demir (2009) that academic performance can be attributed to good infrastructure and the quality of the school environment. A study by Fabunmi, Brai-Abu and Adeniji (2007) which focused on classroom factors as determinants of secondary school students' academic performance in Mathematics in Oyo State, Nigeria, with a sample of 200 out of 336 secondary schools who were randomly selected, revealed that schools with smaller class sizes which included classroom space and class utilisation rate tended to perform better academically than schools with larger class sizes.

In addition, a study by Salfi and Saeed (2007) revealed a significant negative relationship between school size and students' academic performance. The study by Salfi and Saeed (2007) focused on relationship among school size, school culture and students' achievement at secondary school level in Pakistan. The sample for the study included 90 secondary school head teachers and 540 primary, elementary and high school teachers who were working in government boys' secondary schools who were selected randomly. It was revealed that small class size performed better than medium and large class sizes and thus, concluded that class size is inversely related to student's academic performance. The assertion made by Salfi and Saeed (2007) and Fabunmi et al (2007) was emphasised by Kraft (as cited in Adane, 2013) who opined that class sizes above forty (40) relate negatively to the academic performance of students and further noted that large class sizes

are not conducive for serious academic experiences. Studies have shown that schools that possess effective and efficient supervision regarding the teaching and learning activities result in high performance rates of students.

It should be pointed out that supervision being conducted by a school also form part of its atmosphere or climate (Usman, 2015). For instance, a study conducted by Usman (2015) on the impact of instructional supervision on academic performance of secondary school students in Nasarawa State, Nigeria has shown a significant positive relationship between instructional supervision and academic achievement. The study by Usman (2015) was a descriptive survey in which instructional supervision and students' academic performance questionnaire were used to obtain relevant information from 92 teachers and 37 secondary schools using the simple random sampling procedure. The result of Usman's (2015) study showed that regular instructional supervision using robust supervision strategies such as checking of students' notebooks, classroom visitation and inspection by school administrators, checking teachers' lesson plans and inspection of teachers' record keeping have significant positive relationship with teacher and students' performance in the secondary schools that were surveyed.

It is in this regard that a study by Ghanney and Aniagyei (2014) which investigated the poor academic performance of students at public Junior Secondary School level in the Obuasi Municipality of the Ashanti Region of Ghana with sample of 60 students, 15 teachers and 15 parents who were selected through simple random and stratified sampling procedures, revealed that irregular supervision had a significant correlation ($p < .05$, $r = .075$) with performance in Mathematics and that resulted in the poor performance of the schools.

Additionally, a study by Makhubele and Luneta (2014) found that schools in their study allocated 110 minutes per week to senior phase mathematics. This means about an hour of Mathematics teaching is lost per week. This is a significant amount of time lost per term and per year, which results in a chronic and systemic reduction of teaching and learning in class that affects performance in the subject (Makhubele&Luneta, 2014).

Further, Enu, Agyeman and Nkum (2015) examined factors influencing students' Mathematics performance in some selected Colleges of Education in Ghana. The study was a descriptive in nature. Three Colleges were randomly selected for the study. A total of 50 students from these Colleges participated in the study. Data for the study was collected through student's questionnaire. The findings revealed that inadequate teaching and learning materials affected students' academic performance in Mathematics. On the basis of the findings, the following recommendations were made; interactive method of teaching which are core to improving students' holistic understanding of mathematical concepts needs to be used by Mathematics teachers. Also, stakeholders of education need to provide adequate teaching and learning resource to the Colleges of Education.

Further, Adedjei and Owoeye (2002) found a significant relationship between the use of recommended textbooks and academic performance. According to Douglass and Kristin (2000), in a comprehensive review of activity based learning in Mathematics in kindergarten through grade eight, concluded that using manipulative materials produces greater achievement than not using them. They also note that the long-term use of concert instructional materials by teachers knowledgeable in their use improves students' achievement and attitudes. Opare (2009) also asserted that the provision of the needed human and material resources goes a long way to enhance academic performance. Ankomah (1998) noted that effective teaching and learning greatly lied on the competences

of its human resources as well as material resources which were needed for the impartation of knowledge.

Again, Isack (2015) examined factors leading to poor performance in Mathematics subject in Kibaha secondary schools. The findings indicated teaching and learning of Mathematics was facing challenges such as poor teaching environment. According to Kita (2014), schools do not have enough and relevant materials for teaching Mathematics that's why there was low students' academic performance in Mathematics. In the syllabus, it is emphasised that teaching methods in Mathematics should be learner-centered but the materials available in schools, especially the textbooks, do not reflect this approach of teaching (Mtitu, 2014).

Asamoah (2018) studied perceived causes of low academic performance of senior high school students in core Mathematics in the Kumasi Metropolis. The study used the descriptive survey design with quantitative approach. The findings of the study revealed that school-environment factors such as inadequate teaching and learning materials and unavailability of Mathematics textbooks were contributors to the low academic performance in Mathematics.

Effective supervision of instruction improves the quality of teaching and learning (Tshabalala&Ncube, 2013). This was justified by Etsey (2015) that students in private schools perform better academically than their counterparts in public schools due to effective supervision of work. Another factor that might be responsible for low academic performance of students is motivation. For example, it has been underscored that lack of motivation as well as professional commitment result in low or poor attendance and unprofessional attitudes toward students which consequently lead to low students'

performance (Mefor, 2014). Also, factors such as availability and use of teaching and learning materials, class size, and school environment among others, have been noted to affect students' academic performance (Mefor, 2014; Tshabalala&Ncube, 2013).

2.6 Chapter Summary

This chapter has presented the theoretical framework, conceptual framework, the concept of Mathematics, the concept of academic performance, and empirical studies that informed about the study. For the theoretical framework, Constructivism learning theory was used to underpin this study. A constructivism learning theory places the child in an active role in the learning process. Also, Attribution Theory argued that people attribute their success or failure in terms of causes. In order to understand causation of behaviour, they search for explanations or causes.

In conceptual framework, the researcher has given out assumptions on factors that have an influence on pupils' performance in Mathematics. These assumptions have been enlightened with theoretical and empirical literatures reviewed. It was noticed that pupils' performance is the function of teaching and learning methods, teachers'-students' relationship, and school learning environments.

Despite noticeable unsatisfactory performance in Mathematics, a review of the related literature indicated a significant gap in the area of study, factors leading to poor performance in Mathematics subject and the type of samples involved. These areas required in-depth investigation to enlighten the factors for poor academic performance in Mathematics. Majority of the studies conducted were not in Ghanaian. Further, most of them were conducted in senior high schools and tertiary institutions. This suggests that not

much attention had been paid to the factors contributing to poor academic performance of JHS pupils in Mathematics.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

The chapter presents methodology adopted for the study. Subheadings to be discussed included:

1. Research paradigm,
2. Research approach,
3. Research design,
4. Population,
5. Sample and sampling techniques,
6. Data collection instruments,
7. Validity and reliability of the questionnaire,
8. Trustworthiness of the interviews,
9. Data collection procedures,
10. Data analysis procedures,



11. Ethical considerations

3.1 Research Paradigm

The study adopted pragmatic paradigm. Every researcher has a set of beliefs or worldview that guides his/her research questions and methodology. This set of beliefs is known as a research paradigm. A pragmatic paradigm does not commit to any one system of philosophy; rather it focuses on solutions to problems and gathering data through all available methods to understand the problem (Creswell & Creswell, 2018). Rubin and Babbie (2017) argued that pragmatic research is a way of rationally substantiating knowledge; not an attempt to define an objective truth, but rather a discussion of the meaning of things within a situational reality.

For this study, the researcher was interested in understanding factors contributing to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality, Ghana. The purpose of obtaining the pupils, teachers and parents' voice was to bring richer data from real life situations to the research. Furthermore, this paradigm was adopted because it focused on the best methods of data collection to solve a problem instead of an overarching set of beliefs regarding reality. This is in line with what Neuman (2013) argued about that pragmatists tend to focus on applied or action research, with mixed methodology in a natural setting. For this study, the problem was factors contributing to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality, Ghana. The focus was to explore Mathematic teachers and parents' voices which lend itself to a qualitative approach and the use of quantitative results allowed for data triangulation. Therefore, this study used the two approaches to address the research objectives and provided research findings to answer the questions.

Additionally, an interpretive approach allowed for Mathematic teachers and parents' voices to be heard in this study. The qualitative data were enhanced and enriched through audio recordings of the interviews (Saunders, Lewis, & Thornhill, 2012). Similarly, the interpretive lens allowed the researcher to develop meaning units and understanding from the interviews. Aspect of this study took a qualitative approach in that defining factor contributing to poor academic performance in Mathematics among JHS pupils was situational and participants driven. This required the use of a naturalistic setting and the focus on the Mathematic teachers and parents' voices (Sarantakos, 2013).

Furthermore, to help analyse and explain the results of the study from one source via another, the study adopted the pragmatic research paradigm, which drew data from both quantitative and qualitative perspective (Creswell & Creswell, 2018). Again, a practical application of this research was to assist education administrators in developing strategies that would enhance the academic performance of JHS pupils in Mathematics. Moreover, the use of pragmatic paradigm enhanced triangulation of the data (Orodho, 2014). This helped in developing the most comprehensive information regarding factors contributing to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality, Ghana (Marshall & Rossman, 2014).

3.2 Research Approach

The study used mixed methods research approach. With the mixed methods approach to research, researchers incorporate methods of collecting or analysing data from the quantitative and qualitative research approaches in a single research study (Creswell, 2014; Kothari, & Carg, 2014). That is, researchers collect or analyse not only numerical data, which is customary for quantitative research, but also narrative data, which is the norm for

qualitative research in order to address the research question(s) defined for a particular research study.

The use of this approach helped the study to use the strengths of one approach to compensate the weaknesses of the other approach. For example, in using quantitative approach, larger respondents were used for data collection which made it possible for generalisation of the findings. However, in using the qualitative approach, small sample was used and the researcher was able to dive deep into the issue but this approach did not permit generalisation of the findings outside the context within which the study was conducted. Therefore, in using the mixed methods approach, the weakness of the qualitative approach was minimised by the use of the quantitative approach.

This corresponds with what Kothari (2011) argued that the goal for researchers using the mixed methods approach to research is to draw from the strengths and minimise the weaknesses of the quantitative and qualitative research approaches. Kothari (2011) further explained that the strengths and weaknesses associated with the various research approaches are not absolute but rather relative to the context and the manner in which researchers aspire to address the phenomenon under study. For example, if the researcher purports to provide in-depth insight into a phenomenon, the researcher might view selecting a small but informative sample, which is typical of qualitative research. The researcher might use inferential statistics to quantify the results, which is typical of quantitative research, as strengths worthy of combining into a single research study.

Furthermore, the use of this approach helped the study to better understand factors contributing to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality, Ghana. This concurs the assertion by Gall, Gall, and Borg (2010) that

mixed methods approach to research provides researchers with the ability to design a single research study that answers questions about both the complex nature of phenomenon from the participants' point of view and the relationship between measurable variables. Additionally, the use of this research approach helped the researcher to build a stronger case for conclusions through convergence and verification of findings (Creswell & Creswell, 2018). Dudovskiy (2016) posited that proponents of the mixed methods approach to research advocate doing “what works” within the precepts of research to investigate, to predict, to explore, to describe, to understand the phenomenon.

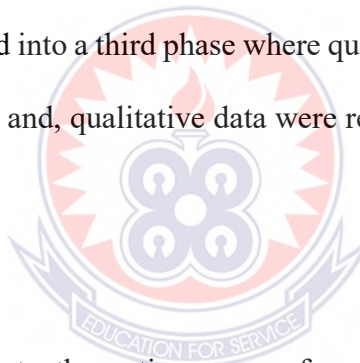
3.3 Research Design

This study adopted sequential explanatory mixed methods design. The study used sequential explanatory mixed methods research design where the researcher first gathered and analysed quantitative data. Afterwards, qualitative data were gathered and analysed based on the issues that came out from the quantitative data. Thus, the interpretation of the results was done after the collection and analyses of both quantitative and qualitative data. This inferred that, in this study, the interview questions which aimed at gathering qualitative data were designed in such a way that it followed from the findings of the quantitative data. In using this design, the researcher placed much emphasis on the quantitative data.

This design was used because there was the need for the study to use qualitative data to confirm the findings from the qualitative data (Creswell & Creswell, 2018). Moreover, multiple sources or methods of data gathering helped in increasing the credibility and dependability of the data since the strengths of one source were used to compensate the potential weaknesses of the other source (Denzin, 2017).

Using sequential explanatory mixed methods design further helped this study to blend different research approaches which allowed the researcher to design research questions within the context and parameters of the study (Creswell & Luketic, 2017). Further, the use of this design led to an explosion of collaborative and creative research (Creswell & Creswell, 2018). Moreover, the use of this design helped the study to answer broader questions by providing a more expansive and creative approach to research (Fraenkel, Wallen & Hyun, 2012).

Also, this design included multiple level strategy by incorporating a two-phase approach where for example, quantitative research was undertaken first, followed by qualitative research; a systematic and planned approach to research (Gall, Gall & Borg, 2010). Each phase was then triangulated into a third phase where quantitative data were used to provide general patterns and width and, qualitative data were reflected upon experience and depth (Creswell, 2015).



3.4 Population

A study population refers to the entire group of people to whom researchers wish to generalise the findings of a study, including persons who did not participate in the study (Creswell & Creswell, 2018). There were 43 public basic schools in Hohoe Municipality (Hohoe Municipality Education Directorate report, 2021). The population for the study was 2,093 pupils (1,029 in JHS 1 and 1,064 in JHS 2), 129 Mathematics teachers and 791 parents (Headteacher's situation report, 2022).

3.5 Sample and Sampling Techniques

A sample of 311 was selected for the study.

3.5.1 Quantitative Sample and Sampling Technique

A sample of 291 JHS pupils was selected. The sample was based on Krejcie and Morgan's (1970) sample size criteria. According to Krejcie and Morgan's (1970) criteria, a population of one thousand, two hundred and thirty (1,230) should have a sample two hundred and ninety-one (291). Therefore, two hundred and ninety-one JHS 1 and 2 pupils in public basic school in the Hohoe Municipality were selected for the study. Of these, 128 were in JHS 1 and 163 were in JHS 2. These selection, were done in each individually selected basic school.

Systematic random sampling was used to select respondents for the quantitative phase of the study. This was because it offered several advantages. For example, it ensured that the sample was representative of the entire population by providing an even spread across the population. Additionally, it was more efficient than simple random sampling because it eliminated the need to repeatedly generate random numbers for each selection. Systematic random sampling was further considered because it is often used when the population size is large and a complete list of population members is available (Creswell, 2015).

To use systematic random sampling to select students for data collection on, the following steps were followed: the researcher first determined the total number of students who were eligible for inclusion in the study (i.e JHS 1 and 2 pupils). The researcher further calculated the sampling interval (n) by dividing the total population size by the desired sample size (i.e 291 respondents). The researcher from there selected a random number between 1 and n as the starting point. This was achieved by generating a random number using a random number generator from a random selection method. The researcher began with the randomly selected starting point and then selected every n th student thereafter. For

instance, the starting point was 7, then the researcher selected students 7, 17, 27, and so on, until the desired sample size, which was 291 was reached. The JHS one and two pupils were selected because they were preparing for their Basic Education Certificate Examination and the researcher deemed it fit not to trouble them.

3.5.2 Qualitative Sample and Sampling Technique

Further, 10 Mathematic teachers and 10 parents were selected using convenience sampling technique. In using convenience sampling technique, during the distribution of the questionnaires to JHS pupils, consent of Mathematics teachers and parents was sought for them to be interviewed. Those who consented were selected for the interviews. Creswell and Creswell (2018) argued that 5-25 participants can be used for interviews. Notwithstanding, Creswell and Creswell's (2018) assertion, the sample for this study was based on data saturation. Thus, the researcher continued with the interviews until the researcher realised that there was no new information to be shared. At that point, Mathematic teachers and parents interviewed so far were recorded as the sample for the study.

3.6 Data Collection Instruments

Questionnaires and interviews were used to gather data for the study.

3.6.1 Questionnaires

A questionnaire is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents (Creswell & Creswell, 2018). Although they are often designed for statistical analysis of the responses, this is not always the case. Questionnaires were used for the study because it, did not require as much

effort from the questioner as verbal or telephone surveys (Barnes, 2019). Further, they were analysed more scientifically and objectively (Creswell & Creswell, 2018).

Additionally, results from the questionnaires were quicker and easily quantified by using a software package (Barnes, 2019). Again, with the help of questionnaire, large amount of information were collected from a large number of JHS pupils in a short period of time and in a relatively cost-effective way and often had standardised answers that make it simple to compile data (Creswell & Creswell, 2018).

The questionnaire had four sections: Sections A-D. Section A was made up of 10 statements that solicited information on pupil factors contributing to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality. Data from section A were used to answer research question one. Also, section B had 8 statements that were used to gather data on how teacher factors contribute to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality. Data from section B were used to answer research question two. Again, 10 statements under section C were used to gather data on ways in which home factors contribute to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality. Data from section C was used to answer research question three. Lastly, section D was made up of 8 statements that was used to gather data on school factors contributing to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality. Data from section D was used to answer research question four.

Respondents were asked to use a 5-point likert scale to respond to statements under section A-D. They were weighed as: Strongly Disagree=1, Disagree=2, Uncertain=3, Agree=4 and Strongly Agree=5. However, negative statements on the questionnaire took the reserve

coding such as: Strongly Disagree=5, Disagree=4, Uncertain=3, Agree=2 and Strongly Agree=1. This helped in increasing the reliability of the questionnaire (Creswell & Creswell, 2018).

3.6.2 Interviews

Semi-structured interview guide was used to gather data. Interviewing involves asking questions and getting answers from participants in a study (Creswell & Creswell, 2018). The study used face-to-face interviews since detailed questions were asked (Yin, 2014). Further, probing questions were used so as to provide rich data (Creswell & Creswell, 2018). Moreover, non-verbal data were collected through informal observation and complex and unknown issues were also explored (Yin, 2014). Additionally, response rates were usually higher than for self-administered questionnaires (Creswell & Creswell, 2018).

Interviews can be structured, semi-structure or unstructured (Yin, 2014). For the purposes of this study, semi-structured interviews were used. This was because it is the best to use it when the researcher would not get more than one chance to interview someone. Also, semi-structured interview guide provided a clear set of instructions for interviewers. Aside this, it provided reliable and comparable qualitative data for the study (Cohen, Manion & Morrison, 2013).

Semi-structured interviews are often preceded by observation, informal and unstructured interviewing in order to allow researchers to develop a keen understanding of the topic of interest necessary for developing relevant and meaningful semi-structured questions (Baškarada, &Koronios, 2018) The inclusion of open-ended questions and training of interviewers to follow relevant topics that may stray from the interview guide provide the opportunity for identifying new ways of seeing and understanding the topic at hand (Cohen

et al., 2013). The semi-structured interview guide had one section: Section A. This section focused on questions that helped the study to gather data in order to answer the research questions.

3.7 Validity and Reliability of the Questionnaire

3.7.1 Validity of the Questionnaire

Face and content validities procedures were used for the questionnaires. Face validity was checked by colleagues pursuing same programme. Questionnaires were given to them to vet it. Suggestions from them were effected before questionnaires were administered. Afterwards, the questionnaires were given to research supervisor who was an expert to vet. Comments from the research supervisor were effected before questionnaires were administered on JHS pupils in public basic schools in Hohoe Municipality.

3.7.2 Reliability of the Questionnaire

Reliability of the questionnaires would be check using pilot testing. Questionnaires were pilot tested among 87 JHS pupils in Ho Municipality in the Volta region, Ghana. This sample was used because according to Gay, Mills, and Airasian (2009), 10-30% of the sample can be used for pilot testing of the questionnaires. Therefore, 30% of the sample for the study which was 88 was used for piloting the questionnaires. These JHS pupils were used because the researcher believed that they have similar features as those to be used in the main study area. After questionnaires had been administered, the data were entered into the Statistical Product for Service Solution (SPSS-version 26). Cronbach alpha reliability coefficient value was calculated and the results were presented in Table 3.1.

Table 3.1: Results on Cronbach alpha reliability coefficient value

Section	Number of Items	Cronbach Alpha Reliability
A	10	.85
B	8	.89
C	10	.86
D	8	.79

Source: Field data, (2021)

(Total Number of Pupils=88)

In Table 3.1, the results indicated that Cronbach alpha reliability coefficient values for sections A, B, C and D were .85, .89, .86 and .79 respectively. This suggests that the questionnaire was reliable. This was because according to Creswell and Creswell (2018), if a Cronbach alpha reliability coefficient value of 0.7 is obtained, then, it suggests that the questionnaire is reliable.

3.8 Trustworthiness of the Interview

Trustworthiness in this study was ensured using credibility, dependability, transferability and confirmability as suggested by Lincoln and Guba (1985).

3.8.1 Credibility

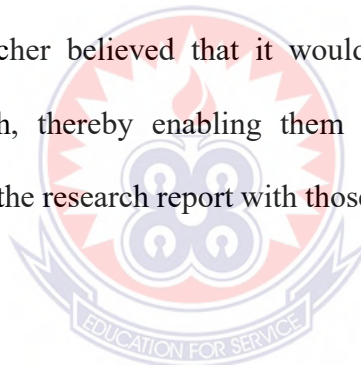
One way to check the credibility of an interview is through member checks. In this study, the researcher sought permission from the participants to record the interviews. After each interview, recordings of the interviews were played to participants for their confirmation. This helped participants to confirm the information they had shared. However, participants who did not allow the researcher to record the interviews, field notes which were taken and read to them. In this sense, these participants also confirmed the information they had shared.

3.8.2 Dependability

For the study to ensure the dependability, reports from the study was presented in detailed. The study provided a detailed description of the research design and its implementation, describing what was planned and executed on a strategic level; the operational detail of data gathering, addressing the minutiae of what was done in the field; and reflective appraisal of the thesis, as well as evaluating the effectiveness of the process of inquiry undertaken. Therefore, the researcher believed that the detailed report would enable other researchers to repeat the work, if not necessarily to gain the same results.

3.8.3 Transferability

In this study, since a sufficient thick description of the phenomenon under investigation was provided, the researcher believed that it would allow readers to have a proper understanding of research, thereby enabling them to compare the instances of the phenomenon described in the research report with those that they had been seen emerge in their situations.



3.8.4 Confirmability

The researcher took steps to help ensure as far as possible that the study's findings were the result of the experiences and ideas of respondents instead of the perceptions, ideas and beliefs of the researcher. To this end, beliefs underpinning decisions made and methods adopted were acknowledged within the research report. Also, the study gave tangible reasons for favouring one approach when others could have been taken and weaknesses in the techniques actually employed were admitted. The study also provided in-depth methodological description to allow integrity of research results to be examined.

3.9 Data Collection Procedures

Permission was sought from gate keepers (head teachers) and participants using an introduction letter from the Head, Department of Mathematics Education in University of Education, Winneba. After securing the permission, preparations were made to administer the instruments on the agreed date, time and venue.

Participants were met and given explanations to the purpose of this research, aspects of confidentiality and anonymity and the anticipated use of the results. Questionnaires were distributed to respondents. They were given 45 minutes to respond to the questionnaires. Afterwards, the questionnaires were retrieved. This helped to ensure 100% return rate.

In conducting the face-to-face interviews, the researcher ensured that the settings for the interviews helped in promoting confidentiality by way of ensuring that the participants were not overheard. Each interview took 15 minutes. Sample for the interview was based on data saturation. Thus, the interview ended when the researcher recognised that there was no new information to be shared by the respondents. In that sense, Mathematics teachers and parents interviewed so far would be recorded as the sample for the interviews.

English language was used for the interviews. The interviews were audio taped after permission had been granted by the respondents. This helped in ensuring a more accurate picture of the questions and answers. Also, it helped in improving the credibility of the interviews. In the same way, the recorded interviews helped the researcher to focus more on the interviewee's non-verbal utterances, and even body language instead of pausing to take field notes. Further, important information (field notes) was written as backup in case the recorder develops a fault.

3.10 Data Analysis Procedures

3.10.1 Quantitative Analysis Procedures

Descriptive statistics were used to analyse this data. Thus, research questions 1, 2, 3 and 4 were analysed using frequencies and percentages. This was because these questions collected ordinal data and they sought to describe the phenomenon under investigation. Statistical Product for Service Solution (SPSS-version 26) was adopted to aid in the analysis of the data. The results were presented in Tables in Chapter Four.

3.10.2 Qualitative Analysis Procedures

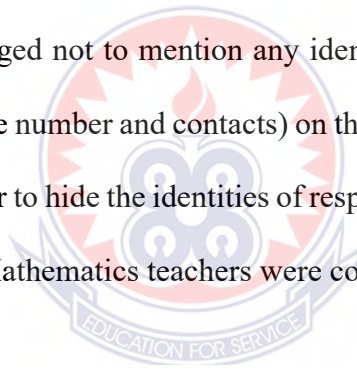
Data were analysed in themes. The researcher used the following process in analysing the data in themes as recommended by Lincoln and Guba (1985).

1. Data familiarisation: The researcher organised data from field notes and recordings of interviews from respondents into transcripts and reread the transcripts several times.
2. Code formation: After the transcription of the data, the researcher organised the data and come up with codes which imaged in the transcripts.
3. Identifying Theme: Researcher transformed the codes into specific themes or categories.
4. Refining the themes: Researcher sorted out the themes. The researcher also checked for repetitions, similarities and differences that emerged so as to refine the data.
5. Defining and naming themes: The researcher refined and defined the themes for the analysis.
6. Reporting: The researcher went through the defined and named themes which were used in the findings and discussion section in Chapter Four.

Ethical Considerations

An approval was obtained from the Head, Department of Mathematics Education in University of Educations, Winneba. This approval was used to seek permission from gate keepers and respondents to collect data. Also, informed consent was sought from the participants after the purpose of the study, intend use of the data and procedures of the investigation were explained to them. Additionally, before the start of the data collection, respondents were assured that data would be kept confidentially. Thus, they were assured that data that would be obtained from them would not be shared to a third party.

Also, participants were assured on anonymity. In doing so, codes were assigned to the various questionnaires and data were kept from the reach of other individuals. Similarly, respondents were encouraged not to mention any identifiable information (such as their' name, email address, house number and contacts) on the questionnaires and the interviews. This assisted the researcher to hide the identities of respondents. For example, parents were coded: P: 1 to P: 10 and Mathematics teachers were coded: MT: 1 to MT: 10.



CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.0 Introduction

This chapter deals with the results and discussions on factors contributing to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality, Ghana. It has one section: Section A which presents the analysis of data and discussion of results.

Section A

4.1 Analysis of Data and Discussion of Results

4.1.1 Research Question 1: To what extent do pupil factors contribute to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality?

The objective of this question was to find out the extent to which pupil factors contribute to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality. Frequencies and percentages were used to analyse quantitative the data. Quantitative results are presented in Table 4.1. Also, the qualitative data were analysed in themes. The results followed by the quantitative results.

Table 4.1: Results by pupil on factors contribute to their poor academic performance in Mathematics

	Strongly Disagree		Disagree		Uncertain		Agree		Strongly Agree	
	f	%	f	%	f	%	f	%	f	%
I learn better when I am in class during lesson delivery	12	4	25	9	30	10	86	30	138	47
Note taking enhances my learning	27	9	28	10	35	12	94	32	107	37
Use of pictures, diagrams and discussions by teachers enhance learning	6	2	12	4	20	7	100	34	153	53
I prefer a quiet place for my personal studies	13	4	13	4	40	14	98	34	127	44
I can't concentrate when a teacher is in class	25	8	31	11	36	12	83	29	116	40
I am skilful and enjoy developing and making graphs and charts	35	12	49	17	27	10	80	27	100	34
Taking instant exercise after a lesson promotes effective learning	7	2	10	3	20	7	99	35	155	53
I can remember best by writing things down several times	10	3	11	4	27	9	101	35	142	49
I can concentrate when a teacher is in class	17	6	21	7	30	10	99	34	124	43
I prefer individual learning to group discussions	21	7	29	10	41	14	95	33	105	36

Source: Field data, (2022)

(Total Number of Pupils=291)

In Table 4.1, the results show that larger part of the students 155(53%) strongly agree that taking instant exercise after a lesson promotes effective learning. This was followed by 153(53%) students who strongly agree that the use of pictures, diagrams and discussions by teachers enhance learning

Again, these students 142(49%) strongly agree that they can remember best by writing things down several times. Some students 138(47%) agree strongly that they learn better when in class during lesson delivery. From the response of the students, 127 (44%) of them prefer a quiet place for their personal studies. Also, a total number of 124(43%) students strongly agreed that they can concentrate when a teacher is in class. Some students 116 (40%) responded that they strongly agree that, they can't concentrate when a teacher is in class.

Again, some students 107(37%) strongly agree that note taking enhances their learning. More so, some 105(36%) strongly agree that they prefer individual learning to group discussions. Some students 100(34%) agree that they are skilful and enjoy developing and making graphs and charts

This finding confirms that of the interview data. For example, P: 2 said:

“My ward once told me that whenever his Mathematicsteacher use teaching materials to teaching, he is able to understand the lesson taught than when he does not use such materials” [P: 2].

P: 1 shared a similar view by saying:

“I have been to school or my ward several time and I have observed Mathematics teachers in the school using Mathematicstextbooks to teach the learners” [P:1].

These comments from parents 1 and 2 signify that these parents have believed that when Mathematics teaching aids are used for teaching, it enhances learners' understanding of concept taught.

MT: 5 also had this to share:

“I sometimes spend some time to explain concepts in Mathematics to the pupils using teaching and learning materials. This I think had promoted better understanding of the lesson I teach” [MT: 5].

MT: 4 also shared a similar view by saying:

“I hardly go to class without teaching aids. This is because I have experienced in my 10 years of teaching that anytime I use teaching aids, it facilitates better understanding of the topics taught [MT: 4].

These comments signify that these Mathematics teachers believed that they place pupils at the centre of the teaching and learning process with the help of teaching and learning materials. The comments further imply that this approach helped in better understanding of lesson taught among learners. From the quantitative and qualitative results, it was concluded that pupils’ inability to pay particular attention in class and their absenteeism contributed to their poor academic performance of JHS in Mathematics in the Hohoe Municipality.

The finding concurs that of Engin-Demir (2009) who found that regardless of intelligence, students who spend more time on assignments and homework are very important activities to improve their grades. The amount of time students invests in homework and other related activities have also been found to be strongly related to motivation. Moreover, Etsey (2005) found that homework to be a correlate of academic performance. Etsey (2005) 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

students” (p. 3). Harbison and Hanushek (2012) found that homework is in reality an interaction between school and the home, and an essential ingredient of the educational process when measuring academic achievement.

Also, Sule (2013) conducted an analysis by assessing the impact of the pupils’ initial characteristics (gender, ethnicity, parental education, geographic region and age) and the academic performance. Sule (2013) found that the students’ initial characteristics have a modest impact on their academic performance and among them parental education is the most significant. In addition, school attendance has a high correlation with individual academic achievement. The success of a pupil in school is predicated by irregular school attendance. Also, Ray and Lancaster (2003) concluded that time spent at work had positive impact on education variables with marginal impact weakening at higher levels of study hours.

4.1.2 Research Question 2: How do teacher factors contribute to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality?

The objective of this question was to find out how do teacher factors contribute to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality. Frequencies and percentages were used to analyse quantitative the data. Quantitative results are presented in Table 4.2. Further, the qualitative data were analysed in themes. The results followed by the quantitative results.

Table 4.2: Results by pupils on factors contributing to their poor academic performance in Mathematics

		Strongly Disagree		Uncertain		Agree		Strongly Agree	
F	%	f	%	f	%	f	%	f	%

Mathematics teachers in this school teach well	21	7	18	6	30	10	95	33	127	44
Mathematics teachers punish me when I am not able to answer questions in class	13	4	15	5	26	9	78	27	159	55
Mathematics teachers abuse me at the least mistake I do	15	5	20	7	31	11	93	32	132	45
I fear Mathematics teachers in this school	10	3	32	11	40	14	90	31	119	41
Mathematics teachers motivate me to learn	21	7	23	8	24	9	80	27	143	49
Mathematics teachers advise me on how to study	13	4	19	7	32	11	98	34	129	44
Mathematics teachers are not punctual in class	14	5	23	8	54	18	90	31	110	38
Mathematics teachers do not use teaching aids when teaching	17	6	17	6	24	8	97	33	136	47

Source: Field data, (2022)

(Total Number of Pupils=291)

The results in Table 4.2 reveal that most students 159(55%) strongly agree that Mathematics teachers punish pupils when they not able to answer questions in class. This was followed by 143(49%) students who strongly agree that Mathematics teachers motivate them to learn. More so, 136(47%) students strongly agree that teachers do not use teaching aids when teaching.

Furthermore, some students 132(45%) strongly agree that Mathematics teachers abuse them at the least mistake they do. Moreover, the results show that students 129(44%) confirm that Mathematics teachers advise them on how to study. The results also show that 127(44%) students also agree strongly that Mathematics teachers in the school teach well. Last but not least, 119(41%) students agree strongly that they fear Mathematics teachers in the school. Lastly, it was recorded that students 110(38%) strongly agree that Mathematics teachers are not punctual in class.

For the qualitative results, P: 2 said:

“I barely see my ward learning mathematics at home in recent time. When I tried to find out, he told me that his Mathematics teacher did not give them any assignment or homework” [P: 2].

Further, P: 10 said:

“I sometimes go to my ward’s school to find out what is going on there. One thing I had observed was that their teachers mostly do not give them homework to do. When I interacted with one of the Mathematics teachers, he told me that anytime she gives assignments or homework to the pupils, they don’t do not. Very few who will also do it will copy among themselves. For that matter, she had stopped giving them homework/assignment” [P: 10].

These comments were different from what P: 7 said that:

“I spoke with my ward’s Mathematics teachers and he told me that he had given my ward some assignments so I should monitor my ward and give him a reply. I have observed my ward for some months now and I always see her studying Mathematics in the evenings.” [P: 7].

The comments from P: 7 suggest that the Mathematics teacher had been giving assignment to the pupil. The comments also indicate that there was cordial relationship between the parent and the Mathematics teacher. The comment signifies that this pupil had been performing the assignment given to him by the Mathematics teacher.

However, MT: 8 said:

“I place my pupils at the centre of the teaching and learning process. For this reason, they are able to understand lessons I teach them” [MT: 8].

Similarly, MT: 2 said:

“I use teaching and learning materials when teaching. For this reason, I make my lessons more practice”. [MT: 2].

Again, MT 10 said:

“I break my lessons into units and present them systemically to my students. As a result, my students are able to grasp lessons I teach them” [MT: 10].

MT: 1 also had this to share:

“I sometimes spend some time to explain concepts in Mathematics to the pupils. But because these students do not come to school regularly, they most of the time score low marks when assessed” [MT: 1].

MT: 3 also shared a similar view by saying:

“I like using practical methods in teaching the students. Meanwhile, while I will be teaching, some of them will also be doing their own thing. For that matter, when I give them exercises, only few of them score high marks [MT: 3].

It could be deduced from these comments that Mathematics teachers use child-centred approach in teaching their lessons. The comments further these Mathematics teachers seem not to be using the lecture method of teaching Mathematics. The results further signify that Mathematics teachers use teaching and learning resources when teaching.

In general, it could be deduced from these comments that while some Mathematics teachers had been encouraging JHS pupils to learn Mathematics at home, others do not. This comment further shows that majority of the Mathematics teachers did not assign some work to their pupils to do them at home. Again, the comments infer that very few of the Mathematics teachers tasked some parents to supervise their children to study Mathematics at home. Based on the quantitative and qualitative results it was concluded that to Mathematics teachers' negative attitudes towards teaching contributed to poor academic performance of JHS pupils in Mathematics in the Hohoe Municipality.

This finding concurs that of Mensah et al.'s (2013) study which focused on senior high school students' attitude towards Mathematics and performance in Ghana with a sample of 100 students and 4 Mathematics teachers who were randomly selected, it was revealed that if teachers exhibit positive behaviour and give good utterances about Mathematics,

students would imitate that behaviour and hence develop positive attitude towards the study of Mathematics.

Also, Clarke, Thomas and Vidakovic (2009) found that teachers' attitude towards Mathematics can be measured in emotional and cognitive behaviours. In this regard, attitudes and practices of teaching Mathematics as a teacher are influenced by beliefs, emotions, content knowledge as well as social context. Again, according to Henderson and Rodrigues (as cited in Mensah et al., 2013), emotional responses toward Mathematics that are found in teachers include like and dislike for Mathematics, anxiety associated with Mathematics and self-confidence regarding Mathematics.

Additionally, from the work of Mwnenda et al. (2013), teachers' absenteeism, lateness and poor teaching methods contribute to the low academic performance of students. The study by Mwenda et al. (2013) focused on factors contributing to students' poor performance in Mathematics in public secondary schools in Tharaka South District, Kenya. The study used the descriptive survey design with a sample of 248 respondents who were selected through stratified and proportionate sampling procedures. The result of the study showed that teachers' absenteeism and lateness contributed to low academic performance of students. According to the World Bank (2004), teachers' lateness and absenteeism at the basic and secondary school levels in Ghana have been worsened over the last years leading to low academic performance of students.

In addition, a study conducted by Wekesa (2010) which focused on assessment of factors affecting students' performance in Mathematics at secondary school level in Kenya, with a sample of 4,500 students, 60 teachers and 150 principals who were selected through stratified sampling techniques revealed that teachers' experience, lateness and absenteeism

affect students' academic performance in Mathematics. The finding of Wekesa (2010) is obvious because, when teachers are late, the teaching and learning processes are also delayed which affect learning outcomes of students when they happen consistently.

Again, Ofoegbu (2004) theorised poor academic performance of students as relating to poor teachers' motivation in accordance with teaching task, negative attitude toward work and poor teaching habits which lead to poor motivation. Likewise, Etsey (2005) found that lack of motivation and low professional commitment by teachers stand the chance of producing poor attendance and unprofessional attitudes regarding students, teaching and learning process which will consequently affect students' academic performance.

This finding depart from the constructivism learning theory since constructivism learning theory places the child in an active role in the learning process (Kuhn, 1974). Kuhn (1974) further argued that learning is not "swallowed whole" but lesson material is modified and transformed based on the child's cognitive structures, social interaction, previous learning, and environment. Interaction with, and manipulation of Mathematical programmes is seen as critical to the development of mathematical knowledge, which is in a state of development and modification (Kuhn, 1974).

4.1.3 Research Question 3: In what ways do home factors contribute to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality?

The objective of this question was to ascertain ways in which home factors contribute to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality. Frequencies and percentages were used to analyse quantitative the data. Quantitative results are presented in Table 4.3. Further, the qualitative data were analysed in themes. The results followed by the quantitative results.

Table 4.3: Results by pupils on ways in which home factors contribute to their poor academic performance in Mathematics

	Strongly Disagree		Uncertain		Agree		Strongly Agree			
	f	%	f	%	f	%	f	%		
I come from a single parent home and this negatively affects my academic performance in Maths	13	4	24	8	29	10	98	34	127	44
My parents assist me in studying Maths at home	7	2	11	4	13	5	87	30	173	59
My parents do not guide at home when I am studying Maths	9	3	16	5	42	15	101	35	123	42
My parents are living together and for that reason assist me to study Maths at home	10	3	10	3	19	7	93	32	159	55
My parents use their educational backgrounds to help me study Maths at home	12	4	15	5	28	10	100	34	136	47
Educational backgrounds of my parents have positive influence on my performance in Maths	11	4	18	6	37	13	106	36	119	41
My parents spend time to teach me Maths homework	10	3	13	5	41	14	82	29	144	49
My parents' employment status does not allow them to help me study Maths at home	15	5	17	6	56	19	96	33	107	37
My parents provide me with Maths learning materials	19	7	20	7	26	9	88	30	138	47
Facilities at home helps me to learn Maths	22	8	32	11	44	15	90	31	103	35

Source: Field data, (2022)

(Total Number of Pupils=291)

Results in Table 4.3 reveal that most students 173(59%) strongly agree that, parents assist them in studying Mathematics at home.

This was followed by 159(55%) students confirming that, their parents are living together and for that reason assist them to study Mathematics at home. Also, some students

144(49%) strongly agree that, their parents spend time to teach them Mathematics homework,

Some students 138(48%) strongly agree that, their parents provide them with Mathematics learning materials. Some also 136(47%) strongly agree that, their parents use their educational backgrounds to help them study Mathematics at home. Furthermore, some students 127(44%) come from a single parent home and this negatively affects their academic performance in Maths. On the other side some students 123(42%) strongly agree that their parents do not guide at home when they are studying Maths.

A part of the students 119(41%) strongly agree that, the educational backgrounds of their parents have positive influence on their performance in Maths. Moreover, some of them 107(37%) strongly agree that their parents' employment status does not allow them (parents) to help them study Maths at home. Lastly, the responses show that some students 103(35%) agree strongly that facilities at home help them to learn Maths.

Regarding the qualitative results, P: 4 said:

“Anytime I am invited for programmes at my child’s school, I stop whatever I am doing and go for that programme. I think this practice has some positive feedback on my child’s performance in school, especially in English language” [P: 4].

Likewise, P: 10 said:

“I make time out of my busy schedules to attend school programmes. Because of that I always have close contact with my child’s teachers. This has helped in improving his academic performance in Mathematics in recent time” [P: 10].

Again, P: 1 said:

“As for my ward’s school, whenever they organise programmes, they inform we the parents. Because of that I also make time and attend such programmes. Because of that I am able to check the academic performance of my child whenever I go to the school” [P: 1].

The comments from these parents denote that they had been regular in terms of attending programmes held in their children’s school. The comments further connote that these parents do a follow-up of their ward’s academic performance most of the time they visit their wards’ school.

Additionally, P: 5 said:

“I have supplied all my children with Mathematics learning materials to study at home. But the problem is, they do not want to learn. Instead, they like playing almost all the time” [P: 5].

Also, P: 8 shared a similar view when she said:

“In growing up, I had a lot of Mathematics books at home to study. For this reason, I had also made provision of Mathematics books at home for all my children. But, one thing I have noticed is that my kids do not like studying maths as I used to. I have said all that I could but I can’t find any positive changes. So, I have decided not to talk again and watch them if they could change for the better” [P: 8].

These views were different from that of P: 9 that:

“I know that Mathematics is the gate way to all the Science related subjects and my child want to become a doctor in future. For that matter, I bought different Mathematics books for her to study at home. Also, I have been guiding her on how to study these Mathematics books at home” [P: 9].

These comments suggest that these parents had provided their children with Mathematics books at home. Further, the comments suggest that these parents wished their children will be very serious with the studying of Mathematics at home. However, the comments signify that their children instead like playing when they are at home.

Additionally, P: 8 said:

“I have bought some Mathematics books for my child to study whenever she comes home. But, I have not seen her doing so. Sometimes when I ask her, she will tell me that she is tired. At time, I become angry at her and beat her up but still, I have not seen any improvement” [P: 8].

P: 4 shared a similar view by saying:

“I provided Mathematics books for my child to study at home. However, I hardly see him studying those books. I have even reported him to his mathematics teachers but I have not seen any positive change in his attitude towards the learning of mathematics” [P:4].

These comments from parents 4 and 8 signify that these parents have provided Mathematics books for their wards at home but their children seem not to study them at home.

This was what MT: 5 said regarding home factors contributing to poor academic performance of JHS pupils in Mathematics

“In fact, when it comes to parents attending school programmes, I can confidently say that major of the them make it to school programmes” [MT: 5]

MT: 7 also said:

““Though parents of these children have busy work schedule, they still make time to attend to school programmes we organise” [MT: 7].

Additionally, MT: 6 said:

“Some of the parents to these children have bought Mathematics books for their children to study at home” [MT: 6].

These comments signify that Mathematics teachers seem to believe that parents involve themselves in pupils' academic performance in Mathematics. This is because the comments suggest that parents take part in school programmes. Also, the comments connote that some parents have provided their children with Mathematics books to study at home. As a result of the quantitative and qualitative results, it was concluded that home factors did not contribute to the poor academic performance of JHS pupils in Mathematics in the Hohoe Municipality.

Considine and Zappala's (2012) study supports this finding that families where the parents are advantaged socially, educationally and economically foster a high level of achievement in their children. Again, Limb and Fullarton's (2012) study in United States of America and Australia on Trends in International Mathematics and Science Study (TIMSS) found that students with more family cultural resources such as books at home and those from two parent rather than single parent families tend to have higher performance levels in Mathematics.

Moreover, Schiller, Khmelkov and Wang (2002) conducted a study on economic development and the effects of family characteristics on Mathematics achievement in middle schools in 30 TIMSS nations. A sample of 219,402 students from 7th and 8th grades were selected through stratified, cluster and proportionate sampling procedures. The results

of the study showed that parents who have better education tend to provide academic and social support to their children.

Findings of Schiller et al.'s (2002) study affirm that of this study that parents who are educated understand the need to educate their children because of the benefit they (parents) have had in their education. This was justified by Johnson and Kyle (2001) in their study. The survey by Johnson and Kyle (2001) used a sample of 3,192 households and 14,924 individuals as well as 6, 719 children who were selected through cluster sampling procedures across Ghana. The findings of the survey showed that educational status of parents was a major factor as contributing to the students' academic performance. Specifically, mother's education has been justified in literature as having a significant influence on the students' academic performance (Johnson & Kyle, 2001).

4.1.4 Research Question 4: What are the school factors contributing to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality?

The objective of this question was to investigate school factors contributing to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality. Frequencies and percentages were used to analyse quantitative the data. Quantitative results are presented in Table 4.4. Further, the qualitative data were analysed in themes. The results followed by the quantitative results.

Table 4.4: Results by pupils on school factors contributing to poor academic performance in Mathematics

	Strongly Disagree		Disagree		Uncertain		Agree		Strongly Agree	
	f	%	f	%	f	%	F	%	f	%
Facilities in school in studying Maths are better than other schools	11	4	15	5	18	6	83	29	164	56
My school library does not have the needed Maths books	9	3	32	11	46	16	98	34	106	36
My school does not have enough classrooms	14	5	16	5	56	19	95	33	110	38
Classrooms are not conducive for learning Maths	17	6	25	9	39	13	91	31	119	41
My school has toilet facilities	19	7	26	9	42	14	100	34	104	36
My school buildings are of poor quality	10	3	30	10	40	14	89	31	122	42
My school has Maths teaching and learning materials	16	5	24	8	42	14	84	30	125	43
My school has graph board for teaching and learning of Maths	7	2	19	7	31	11	88	30	146	50

Source: Field data, (2022)

(Total Number of Pupils=291)

In Table 4.4, the results show that many of the students 164(56%) strongly agree that, facilities in their school in studying Mathematics are better than other schools. This was preceded by this number of students 146(50%) who also agree strongly that, the school has graph board for teaching and learning of Mathematics.

Some of the students 125(43%) accept the fact that, the school has Mathematics teaching and learning materials. But some students 122(42%) also agree strongly that the school buildings are of poor quality. The results show further that 119(41%) students strongly agree that their classrooms are not conducive for learning Mathematics.

Also, some students 110(38%) accept that their school does not have enough classrooms. From the results it was revealed that some students 106(36%) strongly agree that their

school libraries do not have the needed Mathematics books. Some students 104 (36%) strongly agree to the fact that the school have toilet facilities.

For the qualitative results, P: 8 said:

“I know this school was built not long ago and it has almost all the needed facilities a school must have to make teaching and learning effective. For example, my child’s former school did not have a toilet facility. For that reason, my child had to always come home when she wants to attend to nature’s call. This condition sometimes makes her to miss some lessons and it was affecting her performance in Mathematics in particular. But, this problem is not so in this school” [P: 8].

This was confirmed by P: 5 when she said:

“I know some schools that lack toilet facilities. But thank God it is not so in my ward’s school. This helps the students to always be in school till closing. But, in schools where they lack toilet facilities, students have to go to a nearby house whenever they want to go to toilet” [P: 5].

Again, P: 7 said:

“I have been to my ward’s school’s library before and though the Mathematics books there are not many, they good materials for them to use. This can help improve their academic performance in Mathematics” [P: 7].

Similarly, P: 4 said:

“School library is one of the important facilities when is in existence. Because it can help school children to improve their academic performance. For that matter, I think having a school library in this school is going to support children’s learning” [P: 4].

Additionally, MT: 10 said:

“We have adequate teaching and learning materials for Mathematics in this school. Because of that we make teaching and learning more hands-on”
[MTs: 10].

This comment is in line with what MT: 1 said that:

“Unlike the other school I was teaching, this school has adequate teaching aids. Therefore, I make good use of them anytime I go to class to teach”
[MT: 1].

It could be realised from these comments that schools in the study area had library and these libraries had Mathematics books which can be used to pupils to improve their academic performance. These comments from some of the parents and Mathematics teachers further signify that there are adequate teaching and learning materials available to Mathematics teachers. Again, the comments infer that Mathematics teachers make good use of the teaching and learning resources available to them when teaching Mathematics. On this note, it was concluded that school factors did not add to the poor academic performance of JHS pupils in Mathematics in the Hohoe Municipality.

The finding corresponds that of Engin-Demir (2009) who investigated factors that influenced the academic achievement of poor urban primary school students in Turkey. The study used a sample size of 719 respondents which included sixth, seventh and eighth graders who were selected through simple random sampling procedures. The study revealed that attending a school with a good and better school environment or facility is positively related and associated with increased mathematics scores. It can therefore be concluded from the finding of Engin-Demir (2009) that academic performance can be attributed to good infrastructure and the quality of the school environment.

Also, study by Fabunmi, Brai-Abu and Adeniji (2007) which focused on classroom factors as determinants of secondary school students' academic performance in Mathematics in

Oyo State, Nigeria, with a sample of 200 out of 336 secondary schools who were randomly selected, revealed that schools with smaller class sizes which included classroom space and class utilisation rate tended to perform better academically than schools with larger class sizes.

In addition, a study by Salfi and Saeed (2007) revealed a significant negative relationship between school size and students' academic performance. The study by Salfi and Saeed (2007) focused on relationship among school size, school culture and students' achievement at secondary school level in Pakistan. The sample for the study included 90 secondary school head teachers and 540 primary, elementary and high school teachers who were working in government boys' secondary schools who were selected randomly. It was revealed that small class size performed better.

A study conducted by Usman (2015) on the impact of instructional supervision on academic performance of secondary school students in Nasarawa State, Nigeria has shown a significant positive relationship between instructional supervision and academic achievement. The study by Usman (2015) was a descriptive survey in which instructional supervision and students' academic performance questionnaire were used to obtain relevant information from 92 teachers and 37 secondary schools using the simple random sampling procedure. The result of Usman's (2015) study showed that regular instructional supervision using robust supervision strategies such as checking of students' notebooks, classroom visitation and inspection by school administrators, checking teachers' lesson plans and inspection of teachers' record keeping have significant positive relationship with teacher and students' performance in the secondary schools that were surveyed.

The finding contradicts that of Enu, Agyeman and Nkum (2015) who examined factors influencing students' Mathematics performance in some selected Colleges of Education in Ghana. The study was a descriptive in nature. Three Colleges were randomly selected for the study. A total of 50 students from these Colleges participated in the study. Data for the study was collected through student's questionnaire. The findings revealed that inadequate teaching and learning materials affected students' academic performance in Mathematics. The reason could have been that Enu, Agyeman and Nkum's (2015) study used students from Colleges of Education while the current study used pupils, parents and Mathematics teachers.

4.2 Chapter Summary

This chapter deals with the results and discussions on factors contributing to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality, Ghana. It has one section: Section A which presents the analysis of data and discussion of results.

For research question 1 which sought to find out the extent to which pupil factors contribute to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality, it was found that pupil factors negative attitudes contributed to their poor academic performance of JHS pupils in Mathematics in the Hohoe Municipality. In relation to research question 2, which aimed at examining how teacher factors contribute to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality, it was discovered that Mathematics teachers' negative attitudes towards teaching contributed to poor academic performance of JHS pupils in Mathematics in the Hohoe Municipality.

Further, research question 3 gave attention to ways in which home factors contribute to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality,

it was identified that home factors did not contribute to the poor academic performance of JHS pupils in Mathematics in the Hohoe Municipality. Lastly, regarding research question 4 which purposed to investigate school factors contributing to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality, it was concealed that school factors did not add to the poor academic performance of JHS pupils in Mathematics in the Hohoe Municipality. Chapter Five would focus on summary, conclusion, recommendations and suggestions for further studies.



CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter deals with the summary, conclusion, recommendations and suggestions for future studies on factors contributing to poor academic performance in Mathematics among junior high school pupils in the Hohoe Municipality.

5.1 Summary

The study investigated factors contributing to poor academic performance in Mathematics among junior high school pupils in the Hohoe Municipality. The study sought to:

1. Examine the extent to which pupil factors contribute to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality.
2. Identify how teacher factors contribute to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality.
3. Ascertain ways in which home factors contribute to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality.
4. Investigate school factors contributing to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality.

The study adopted pragmatism research paradigm. The study also used mixed methods approach. The study further adopted sequential explanatory mixed methods design. A sample of 311 was selected for the study. It comprised 291 pupils, 10 Mathematics teachers and 10 parents. Systematic random and convenience sampling techniques were used to select respondents in this study. Questionnaire and interview guide were used to collect data. Means and standard deviations were used to analyse the quantitative data while the qualitative data were analysed using themes.

5.1.1 Key Findings

The following key findings were identified in the study:

1. Pupil negative attitudes towards the studying of Mathematics contributed to their poor academic performance of JHS pupils in Mathematics in the Hohoe Municipality.

2. Mathematics teachers' negative attitudes towards teaching contributed to poor academic performance of JHS pupils in Mathematics in the Hohoe Municipality.
3. Home factors did not contribute to the poor academic performance of JHS pupils in Mathematics in the Hohoe Municipality.
4. School factors did not contribute to the poor academic performance of JHS pupils in Mathematics in the Hohoe Municipality.

5.2 Conclusion

It was concluded that there are numerous causes of poor academic performance in Mathematics among JHS pupils in Mathematics in the Hohoe Municipality. These range from those which are more of pupil-related and Mathematics teacher-learner centered. The study showed that poor academic performance is also a product of mathophobia. Mathophobic learners are generally poorly motivated to do the Mathematics and hence underperform. The study revealed that many JHS pupils believe that Mathematics is a subject for those who are very bright. This kind of thinking is deeply rooted in the society from which these learners come. Therefore, mathophobia is a social construct and society should change its attitude to Mathematics if learners are to do better.

Again, it was concluded that the way and manner Mathematics teachers teach the subject could be a cause to poor academic performance of JHS pupils in Mathematics in the Hohoe Municipality. Coupled to this, some JHS pupils fail Mathematics because of poor teaching methods employed by the Mathematics teachers. This signifies that some of the Mathematics teachers perhaps do not explain well while others are too fast. Meanwhile, these JHS pupils may have preferred the interactive methods used in teaching Mathematics.

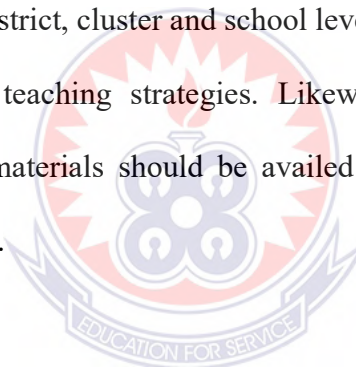
Further, it was concluded that parents provided the necessary home support for their children's education in Mathematics. This was done through the provision of learning materials and willingness of parents to supervise their children's learning in Mathematics. However, it was discovered that these JHS pupils were not making good use of the opportunity they had at home; hence, their poor academic performance in Mathematics. Finally, it was concluded that the school created a conducive learning environment for JHS pupils to improve their learning in Mathematics. This was established through the supply of teaching and learning resources in Mathematics and low-class sizes. But these resources were not fully utilised by both JHS pupils and Mathematics teachers, therefore, contributing to JHS pupils' poor academic performance in Mathematics.

5.3 Recommendations

The following recommendations are made based on the findings of the study:

1. Mathematics needs a lot of practice. Therefore, Mathematics teachers in the Hohoe municipality should give adequate homework to the JHS pupils so as to keep them practicing whenever they go home.
2. In-service training on factors contributing to poor academic performance of pupils should be given to all Mathematics teachers in the Municipality by the personnel in-charge of training and supervision at the Municipal Education Directorate, Hohoe. Through this programme, experienced Mathematics teachers can be invited to interact with these Mathematics teachers on how best they could help JHS pupils improve their performances in Mathematics. It is also recommended that Mathematics teachers should use a variety of instructional materials and strategies for pupils to understand better.

3. Headteachers and the school improvement supervision officers (SISO) in the Hohoe Municipality should meet parents and caregivers and acknowledge them for the learning materials they provided for their children to study Mathematics at home. Similarly, these parents or caregivers should be motivated by the headteachers and SISO to supervise their children to study Mathematics at home regularly. Again, parents or caregivers could be encouraged by the headteachers and SISO to look for extra tuition for their children's Mathematics education at home.
4. Staff development workshops should be organised by the school personnel in-charge of training and supervision at the Municipal Education Directorate, Hohoe at regional level, district, cluster and school level so that Mathematics teachers can share the current teaching strategies. Likewise, enough textbooks and other teaching/learning materials should be availed for JHS pupils to utilise in their learning endeavour.



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Dear Respondent,

The study aims at investigating factors contributing to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality, Ghana. It is against this background that you have been randomly selected to participate in the research by completing the questionnaire. It would thus be very helpful if you assist by answering the questionnaire as per instructions at the beginning of each section.

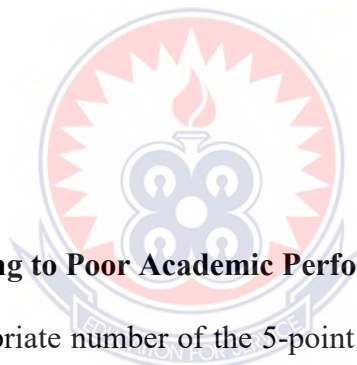
Please, you are required to provide the most appropriate answer in your response. The questionnaire has four sections: Sections A, B, C, and D. Please, respond to all the questions under the four sections. Your responses will be kept confidential. In any case the questionnaire is anonymous.

Thank you.

Yours faithfully,

Felicia Newman

(Researcher)



SECTION A

Pupil Factors contributing to Poor Academic Performance of Pupils in Mathematics

Kindly tick (√) the appropriate number of the 5-point likert scale (**1=Strongly Disagree, 2 =Disagree, 3 = Uncertain, 4= Agree and 5 = Strongly Agree**) as it sincerely applies to you. Please, there are no rights or wrong answers.

S/No	Pupil Factors	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
1.	I learn better when I am in class during lesson delivery					
2.	Note taking enhances my learning					
3.	Use of pictures, diagrams and discussions by teachers enhance learning					

4.	I prefer a quiet place for my personal studies					
5.	Group discussions are good environment for my effective studies					
6.	I am skillful with and enjoy developing and making graphs and charts					
7.	Taking instant exercise after a lesson promotes effective learning					
8.	I can remember best by writing things down several times					
9.	I can concentrate when a teacher is in class					
10.	I prefer individual learning to group discussions					

SECTION B

Teacher Factors contributing to Poor Academic Performance of Pupils in Mathematics

Kindly tick (✓) the appropriate number of the 5-point likert scale (1=Strongly Disagree, 2=Disagree, 3=Uncertain, 4=Agree and 5=Strongly Agree) as it sincerely applies to you. Please, there are no rights or wrong answers.

S/No	Teacher Factors	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
1.	Mathematics teachers in this school teach well					
2.	Mathematics teachers punish me when I am not able to answer questions in class					

3.	Mathematics teachers abuse me at the least mistake I do					
4.	I fear Mathematics teachers in this school					
5.	Mathematics teachers motivate me to learn					
6.	Mathematics teachers advise me on how to study					
7.	Mathematics teachers are not punctual in class					
8.	Mathematics teachers do not use teaching aids when teaching					

SECTION C

Home Factors contributing to Poor Academic Performance of Pupils in Mathematics

Kindly tick (√) the appropriate number of the 5-point likert scale (1=Strongly Disagree, 2=Disagree, 3=Uncertain, 4=Agree and 5=Strongly Agree) as it sincerely applies to you. Please, there are no rights or wrong answers.

S/No	Home Factors	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
1.	I come from a single parent home and this negatively affects my academic performance in Maths					
2.	My parents assist me in studying Maths at home					

3.	My parents do not guide at home when I am studying Maths					
4.	My parents are living together and for that reason assist me to study Maths at home					
5.	My parents use their educational backgrounds to help me study Maths at home					
6.	Educational backgrounds of my parents has positive influence on my performance in Maths					
7.	My parents spend time to teach me Maths homework					
8.	My parents' employment status do not allow them to help me study Maths at home					
9.	My parents provide me with Maths learning materials					
10.	Facilities at home helps me to learn Maths					



SECTION D

School Factors contributing to Poor Academic Performance of Pupils in Mathematics

Kindly tick (✓) the appropriate number of the 5-point likert scale (**1=Strongly Disagree**, **2 =Disagree**, **3 = Uncertain**, **4= Agree** and **5 = Strongly Agree**) as it sincerely applies to you. Please, there are no rights or wrong answers.

S/No	School Factors	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
1.	Facilities in school in studying Maths are better than other schools					
2.	My school library does not have the needed Maths books					
3.	My school does not have enough classrooms					

4.	Classrooms are not conducive for learning Maths					
5.	My school has toilet facilities					
6.	My school buildings are of poor quality					
7.	My school has Maths teaching and learning materials					
8.	My school has graph board for teaching and learning of Maths					

Thank you very much for completing all the statements



INTERVIEW GUIDE FOR PARENTS

Dear Respondent,

The study aims at investigating factors contributing to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality, Ghana. It is against this background that you have been randomly selected to participate in the research by responding to the interview questions. It would thus be very helpful if you assist by answering the following questions as per instructions at the beginning of the interview guide.

Please, you are required to provide the most appropriate answer in your response. Please, respond to all the questions. Your responses will be kept confidential. In any case the interview is anonymous.

Thank you.

Yours faithfully,

Felicia Newman

(Researcher)



SECTION A

Pupil factors contributing to poor academic performance of JHS pupils in Mathematics

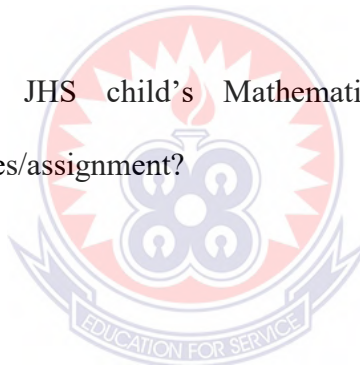
1. How do you see your JHS child's academic performance in Mathematics?
2. How do you perceive your JHS child's learning in Mathematics at home?
3. What are some of the learning activities your JHS child performs when he comes home?
4. What influence do you think these learning activities have on your JHS child's academic performance in Mathematics?
5. What Mathematics learning materials do your JHS child have at home?

6. How does your JHS child learn Mathematics at home?

SECTION B

Teacher factors contributing to poor academic performance of JHS pupils in Mathematics

1. How do you perceive the relationship between your JHS child and his/her Mathematics teachers?
2. Describe the nature of Mathematics homework/assignments given to your JHS child by his/her Mathematics teachers?
3. How supportive have you observed your JHS child's Mathematics teacher being to him/her?
4. How does your JHS child's Mathematics teacher mark your child's homework/exercises/assignment?



SECTION C

Home factors contributing to poor academic performance of JHS pupils in Mathematics

1. What Mathematics learning materials have you supplied to your JHS child?
2. What are the Mathematics learning materials do your JHS child lack at home?
3. What school bills do you pay for your JHS child in the name of Mathematics?
4. Describe the kind of support you give to your JHS child to complete his/her Mathematics homework?
5. How do you think your educational background, income and nature of work help you guide your JHS child to learn Mathematics at home?

6. What are some of the activities/events/programmes you attend at your JHS child's school?
7. How do these activities/events/programmes you attend at your JHS child's school affect his or her academic performance in Mathematics?



SECTION D

School factors contributing to poor academic performance of JHS pupils in Mathematics

1. What are some of the Mathematics learning materials available to your JHS child's at school?
2. Describe the nature of classrooms in your JHS child's school?
3. How do the nature of classrooms support in your JHS child's learning in Mathematics?
4. Describe the nature of tables and chairs your JHS child's school?

5. How do the nature of tables and chairs support in your JHS child's learning in Mathematics?
6. What support systems do you think are available in your JHS child's school which helps in his/her learning in Mathematics?
7. Do you have any other comments based on what we have discussed so far?



APPENDIX C

INTERVIEW GUIDE FOR MATHEMATICS TEACHERS

Dear Respondent,

The study aims at investigating factors contributing to poor academic performance in Mathematics among JHS pupils in the Hohoe Municipality, Ghana. It is against this background that you have been randomly selected to participate in the research by responding to the interview questions. It would thus be very helpful if you assist by

answering the following questions as per instructions at the beginning of the interview guide.

Please, you are required to provide the most appropriate answer in your response. Please, respond to all the questions. Your responses will be kept confidential. In any case the interview is anonymous.

Thank you.

Yours faithfully,

Felicia Newman

(Researcher)



SECTION A

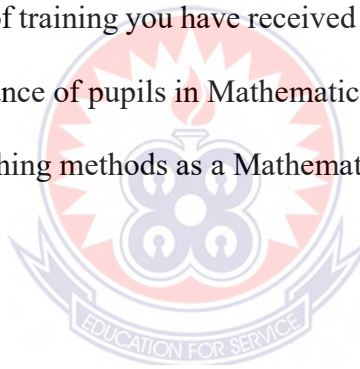
Pupil factors contributing to poor academic performance of JHS pupils in Mathematics

1. How do you perceive the academic performance of JHS pupils' in Mathematics?
2. What Mathematics learning activities do you think JHS children perform at home?
3. What influence do you think these Mathematics learning activities have on these JHS pupils' academic performance?
4. How does the JHS children learn Mathematics at school?

SECTION B

Teacher factors contributing to poor academic performance of JHS pupils in Mathematics

1. How do you perceive your relationship with the JHS pupils?
2. Describe the nature of Mathematics homework/assignments you give to your JHS pupils?
3. How supportive have you been to the JHS children in learning Mathematics?
4. How do you mark and discuss homework/exercises/assignment you give to your JHS pupils?
5. Describe the kind of training you have received that you think can help improve the academic performance of pupils in Mathematics?
6. Describe your teaching methods as a Mathematics teacher?



SECTION C

Home factors contributing to poor academic performance of JHS pupils in Mathematics

1. What Mathematics learning materials do you think the JHS pupils have at home?
2. What Mathematics learning materials do you think the JHS pupils lack at home?
3. Describe the kind of support you think parents give to their JHS children to complete their Mathematics homework?

4. What are some of the activities/events/programmes you think JHS pupils go through at home that can help improve their academic performance in Mathematics?
5. How do these activities/events/programmes the JHS pupils go through at home affect their academic performance in Mathematics?
6. In what ways do parents' educational background, income and nature of work help them to guide their JHS children to learn Mathematics at home?



SECTION D

School factors contributing to poor academic performance of JHS pupils in Mathematics

1. What are some of the Mathematics learning materials available to you in this school?
2. Describe the nature of classrooms in this school?

3. How do the nature of classrooms available in this school support JHS pupils' learning in Mathematics?
4. Describe the nature of tables and chairs in this school?
5. How do the nature of tables and chairs support in JHS pupils' learning in Mathematics?
6. What support systems do you think are available in this school which help in pupils' learning in Mathematics?
7. Do you have any other comments based on what we have discussed so far?

