

## EXPLORING FACTORS THAT HINDER SENIOR HIGH SCHOOL STUDENTS' ACADEMIC PERFORMANCE IN MATHEMATICS

### ABSTRACT

This study's goal was to investigate the factors affecting senior high school students' academic performance in the Kassena-Nankana Municipality. Eighty-one (81) students, sixty-three (63) males and thirty-seven (37) females were used to gather cross-sectional data on demographics and factors influencing their mathematics ability. They came from two senior high schools in the municipality, which were randomly sampled. Students in the chosen schools were asked to fill out questionnaires. The data was examined using a qualitative study that used a survey design to carry out the investigation. The findings showed that students' attitudes play a significant role in determining how well they succeed in mathematics. These include pupils who don't find mathematics very intriguing and who aren't motivated to learn the subject, among other things. Again, there was evidence of significant teacher-related variables that hampered student performance in mathematics. Examples include teacher absenteeism and inadequate time allotted for mathematics classes. Additionally, parental factors like parents' inability to provide their children with necessary mathematics learning materials, parents' unwillingness to encourage their children to study mathematics, and parents' failure to monitor their children's progress in mathematics performance were all factors that hampered students' performance. After in-depth discussion of the findings, pertinent recommendations were made, including the need to increase parental involvement in their children's education and to create a suitable learning environment for pupils on the part of both teachers and parents.

# INTRODUCTION

## 1.0 Overview

This chapter provides information on background to the study, statement of the problem, purpose of the study, objectives of the study, research questions, significance of the study, limitations and delimitations of the study, organization of the study, and definition of terms.

## 1.1 Background of the Study

In order to establish national goals and achieve high levels of progress, economic welfare, scientific standards, cultural consciousness, and technological advancement, education is seen as the tool that is utilized to integrate people into society. According to Kitta (2004), mathematics is the language that enables us to express concepts and connections gleaned from the outside world. Making the unseen visible through the use of mathematics allows one to solve difficulties that would be otherwise impossible. Math is studied as a foundational subject in schools for this reason. Even though mathematics plays a large part, the majority of students still find it challenging to pass and continue it at the higher levels. Most emerging nations, like Ghana, require highly educated individuals not just in traditional sectors but also in the scientific and technical fields, which are crucial for the nation's development. Education in mathematics is a cornerstone and essential instrument for global development in science, technology, and economy. Many other disciplines and languages may be understood through the use of mathematics. In a broad sense, it serves as the foundation for several sciences, including astronomy, engineering, and physics.

According to Ayebale, Habaasa, and Tweheyo (2020), mathematics is seen by society as the foundation of scientific technological knowledge that is vital in social-economic development of a nation. In fact, studies suggest that mathematics as a subject affects all aspects of human life at different levels. This paper is a rapid systematic review of factors affecting students' achievement in mathematics. We searched literature on student achievement in mathematics. We used ERIC database and supplemented with Google Scholar and random Google search. Twenty-six articles met the final selection criteria and were reviewed. The teaching methods, teachers' attitude, students' attitude towards mathematics were noted as key factors in almost all articles reviewed. There seemed to be consistency too that parents can exert a positive influence on their children's mathematical performance, classroom environment, students' previous mathematics achievement and gender related factors. Student achievement at secondary level determines whether they will opt to or qualify to study statistics at university. From this review, it is imperative that these factors be addressed early in the students' career so as to have more student enrollment for statistics at tertiary institutions.

Compared to other topics, mathematics is more helpful in daily life. Without mathematics, it would be challenging to lead a normal life everywhere in the world. Mathematics is undoubtedly one of the most valuable topics. Githua and Mwangi (2003) are of the view that, the study under this topic is of much essence. Such includes majority of disciplines; a foundational understanding of mathematics is required. All sciences, including economics, geography, and many

more, are built upon it. Students' experiences with mathematics have a significant influence on their ability to achieve and realize their full potential. Despite repeated reviews of the mathematics curriculum, student performance didn't appear to get any better. Parents, teachers, the government, and other interested parties have demanded an investigation into mathematics achievement since this continues to be a major problem. According to Kiptoon, a former secretary in the Kenyan Ministry of Education (MOEST, 2001), instructors who lack subject expertise and are generally inexperienced are to blame for pupils' poor academic achievement in mathematics (PTA teachers). In order to support teachers' professional development, the government created remote learning programs called School Based in 2001 under the Ministry of Education. The urgent need to improve mathematics performance as a low-achieving subject for career growth is the reason behind this. According to Eshiwani (1993), characteristics that affect students' success in math and science are intimately tied to how they feel about these disciplines. He says that elements including the availability of instructional materials and learning tools like math models, libraries, books, labs, equipment, and chemicals. However, further research is required to determine how these variables affect students' performance in particular ways. According to Webster (1966), educational philosophy should work to enhance common school procedures. At all educational levels, this should be done with the intention of providing pupils a feeling of reality. Converting classrooms into workshops, laboratories, libraries, and places where mathematical teaching is experimented with.

### **1.2 Statement of the problem**

Despite the fact that mathematics is a topic that all students in Ghana must learn in both elementary and secondary school, student performance in this subject has not been sufficient. Its expertise is used in every field, including daily life. Unfortunately, data show that math achievement has consistently been poor throughout time. According to the West African Examination Council (2006), 15.53% of 18,673 students passed with a grade range of A1–C4. In the same way, 30.29% of the 9,776 students who took the test in optional mathematics passed with grades A1–C4. Ghana took part in the Trends in International Mathematics and Science Study (TIMSS) twice, and both times it finished second to bottom. Ghana's eighth graders finished 43rd out of the 44 nations that took part in 2003, surpassing only South Africa (TIMSS, 2003). Ghanaian eighth graders again placed 46th out of 47 nations in 2007. (TIMSS, 2007). This explains the urgent need to improve mathematics, a subject that performs poorly in terms of career advancement. Therefore, it is necessary for the researcher to undertake research to identify the elements affecting kids' academic performance in the Ghanaian society.

### **1.3 Purpose of the Study**

The aim of this study was to investigate the variables that students believe hamper their academic achievement in mathematics at the senior high school level. The study would examine the pupils' personal variables. The youngsters were also asked about their opinions of their teachers and parents.

#### **1.4 Objectives of the study**

The objective of the study is to:

1. Use the questionnaire to examine the personal variables that students believe are impeding their academic achievement in mathematics.
2. Identify the teachers' influences on student academic success in mathematics.
3. Look at parental or familial issues that affect students' academic achievement in mathematics.

#### **1.5 Research Question**

The following research questions guided the study:

1. What are the some of the students' factors that hinder their performance in mathematics?
2. What are the attributes of teachers that hinder the academic performance of their students in mathematics?
3. How does parental or family factors hinder the academic performance of student mathematics?

#### **1.6 Significance of the Study**

Other researchers will find this study useful as a reference for studies looking at pupils' arithmetic performance. The researcher really hopes that by completing this study, teachers and parents will be better able to interact with their children and understand several variables, which will improve their level of arithmetic success. There is little question that the parents and instructors themselves do not come up with strategies to improve students' mathematics ability in school owing to a lack of knowledge, impatience, financial difficulties, and notably illiteracy. However, the study was an attempt to investigate some of the elements that frequently prevent pupils from achieving greater academic achievement in mathematics. The results will enable teachers and parents adopt some new approaches to interacting with pupils for the benefit of Ghanaian society, both for teacher direction and parental knowledge.

#### **1.7 Delimitation of the Study**

The study was carried out in the Kassena-Nankana Municipality, which has both publicly and privately-run secondary schools. Few schools were found in the rural parts of Kassena-Nankana Municipality, whereas most were found in urban areas. As they would be able to give accurate data on the teaching and learning process as well as students' arithmetic performance, mathematics instructors were in a position to be included in the study's sample.

#### **1.8 Limitations of the Study**

Because of the study's tiny sample size, there will be little room for generalization in its findings. Although the whole population could not be included in the study, a sample of both teachers and pupils was chosen at random. While mathematics instructors and pupils were chosen at random, school leaders and academic experts were purposefully chosen. These made up the representative sample from which general conclusions might be drawn.

#### **1.9 Organization of the Study**

The investigation's report is divided into five chapters. The study's context, explanation of the problem, goal, research aims, and research questions are

presented in Chapter 1's introduction. The literature pertinent to the current investigation is reviewed in Chapter 2. The research approach is described in Chapter 3. The statistical findings for the research are covered in Chapter 4 along with a discussion of the findings. The study's summary findings are presented in Chapter 5, along with conclusions and suggestions.

#### **1.10 Definition of Terms**

These are definitions for some of the terms used in this study

##### **Performance**

This refers to the achievement of goals, objectives set in mathematics.

##### **Teacher Characteristics**

Additionally, this refers to the qualities and methods that influence a teacher's success or failure. These include being fair, having a good perspective, being prepared, adding a personal touch, being creative, acknowledging mistakes, forgiving others, respecting kids, upholding high standards, demonstrating compassion, and fostering a sense of community.

##### **School Environment**

The physical environment of a school includes things like the size of classrooms, the amount of light or darkness, temperature, how the chairs are arranged, and noise levels that might attract instructors and students.

##### **Curriculum**

A series of potentially unpleasant events set up in schools for the purpose of disciplining children. This is done in teams or alone, inside or outside of the school.

##### **Teaching Method**

These consist of the instructional principles and methods. Class participation, demonstration, recitation, memorization, or mixtures of these, as well as teacher- and student-centered methods, are examples of frequently used teaching techniques.

##### **Qualified Teacher**

This is the instructor who possesses the following credentials, such as a Masters in Education or a PhD. from an accredited university or institution in Ghana or elsewhere, or a Diploma in Education, B.Ed., B.Sc. (Ed), B.Sc. and PGDE.

## LITERATURE REVIEW

### 2.0 Overview

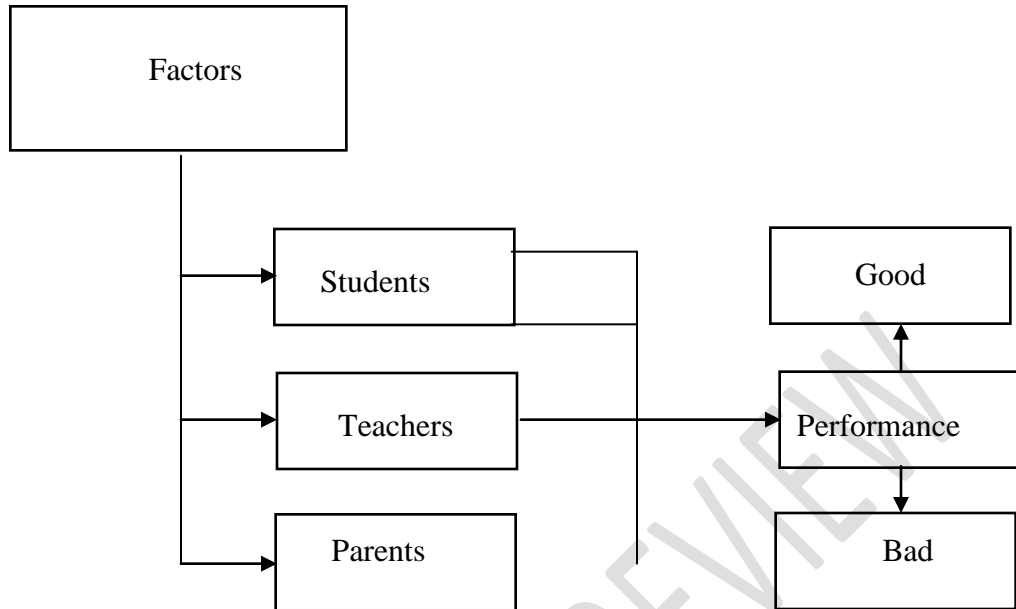
The conceptual and theoretical underpinnings for the investigation are described in this chapter. The conceptual framework has provided a diagrammatic assumption on the elements that interfere with students' academic achievement in mathematics. With the help of a survey of theoretical literature, these assumptions have been clarified.

### 2.1 Theoretical Framework

Theoretical framework is the structure that can hold or support a research study. Since human beings attribute their success or failure to something, the researchers selected the Attribution Theory of Weiner (1979) as a 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 behavior, they search for explanations or causes. They attempt to maintain a positive self-image when they do well by Causes of Poor Academic Performance in Mathematics Maganga (2013), as he made a study on Plato and Socrates work, he found that the knowledge of geometry has been in possession even before the birth of a child. Thus according to Plato it is known that the ideas or general concept behind the concrete entities were experienced through senses, by means of questions set that awaken knowledge or understanding of such ideas behind concrete phenomena. This implies that students could become good in mathematics as teachers give them more questions to awaken their knowledge and understanding on mathematics concepts.

### 2.2 Conceptual Framework

The conceptual framework hereunder presented variables that influence teaching and learning in mathematics subject. Sitko (2013), defined conceptual framework as the system of concepts, assumptions, expectations, beliefs, and theories that support and inform about the study. Students' performance in mathematics is influenced by the teaching and learning methods and students' cultural backgrounds. Students' performance in mathematics is influenced by the teaching and learning methods and students' cultural backgrounds. Teaching methods are such as teacher centred method, students' centred method and type of homework assignments offered to students. Learning methods are such as group discussions when solving problems and individual work as provided by the teacher or as in textbooks. The relationship between teachers and students, the way students are punished might influence student's performance in mathematics (Sitko, 2013). The figure 1 is the conceptual framework that guided the study.



**Figure 1: Conceptual Framework**

### 2.3 Students Factors

Students' attitudes toward mathematics have an impact on the effort they make to comprehend and practice mathematical ideas and techniques. The National Research Council (2000), referenced in Akey (2006), indicates that engagement levels and emotional states that either support or hinder students' capacity to succeed academically are strongly related to students' ideas about their competence and expectations for success in school. As a result, a student's attitudes dictate the amount of effort he will likely put into learning the subject (mathematics). In order to ensure that their pupils perform well, math teachers must work hard and maintain a positive attitude about the subject. Many more According to studies, mathematics is seen negatively by students as being challenging. Additionally, Ayebale, Habaasa, and Tweheyo (2020) concur that students' attitudes are thought to influence how well they perform mathematically in various studies. There is a clear relationship between students' attitudes about mathematics and their academic success, according to a comparative study. Between student attitude and academic achievement was found to be positively correlated in a research of primary school students. More research backs this up. It has been observed that students approach mathematics as a procedural and rule-oriented subject. They are allegedly prevented from experiencing the depth of mathematics and the variety of techniques that can be employed to improve one's proficiency in the field as a result.

According to Sparks and Sarah (2011), is a significant element in the difficulty of learning and teaching mathematics. As a result, it significantly adds to the problems that prevent students from performing well in mathematics classes. The majority of secondary school pupils believe mathematics to be the most

challenging, abstract, dangerous, and uninteresting subject, according to an assessment of school-based education studies. According to Larzim, Abu, and Wan's 2003 research, students' interest in mathematics decreases as they advance from primary to secondary education because they believe the subject to be challenging. According to Armstrong (2009), the technique, mathematical expertise, assessment, and character of the mathematics discipline of teachers can all contribute to math fear. Some people view the idea that mathematics is a challenging subject as a challenge, such that if they are successful in solving mathematical issues, they feel fulfilled and driven to pursue higher level mathematics. On the other hand, if they fail, they will feel inadequate and have low self-esteem. The way that students approach the subject of mathematics is very important because it helps them overcome whatever problems they may be experiencing. Any effort a math instructor makes, no matter how modest, should be considered in order to raise student achievement. According to literature, the majority of pupil's regard mathematics to be a challenging subject due to mathophobia (Sparks, & Sarah, 2011). For students to pay attention, mathematics needs to be taught in a clear, informative, and engaging manner (Sparks, & Sarah, 2011).

In their study, Ali, et al. (2010) found that many pupils were regarded as underachievers in mathematics. Although the students' math performance did not match their intellectual aptitude, they were generally intelligent or above average. Numerous aspects had been noted. The most important factor affecting a student's capacity for successful academic performance is their level of intelligence (Nichols, & Sutton, 2013). They won't like teaching and learning if they lack the cognitive ability to comprehend and retain the knowledge and skills provided. Additionally, it has been noted that bright students frequently assist the underachievers in improving their academics and boosting their self-esteem (Nichols, & Sutton, 2013). The academic performance of students with low IQ levels is bad. Nichols and Sutton (2013) state that in order to identify children with limited mental capacity and help them grasp mathematical ideas so they can perform better in mathematics, teachers need to build strong relationships with their pupils.

Students' attitudes toward mathematics have an impact on the effort they make to comprehend and practice mathematical ideas and techniques. According to Akey (2006), students' expectations for academic success and views about their competence are strongly related to their levels of involvement as well as to emotional states that either support or hinder this capacity. Thus, a student's attitudes influence the amount of work he or she is likely to put into learning mathematics. For students to do well, math teachers must work hard and maintain a positive attitude toward the subject. Additionally, pupils' and adults' hatred of math is linked to dread and anxiety. Adults may develop unfavorable attitudes toward the issue as a result of this anxiety and fear, and these attitudes are then transmitted to children by adults.

Regardless of IQ, students who put more time into their homework and assignments get better grades, claims Engin-Demir (2009). Additionally, it has been discovered that motivation is closely tied to how much time kids spend on

their homework and other related tasks (Butakor, 2016; Butakor, et al., 2017). Etsey (2005) discovered a correlation between academic success and homework. According to him, homework "bears a good link with learning outcomes when it is related to learning objectives, assigned consistently in appropriate amounts, properly explained, motivating, and collected and reviewed during class time, and used as an opportunity for feedback to students" (p. 3). When evaluating academic progress, homework is a crucial component of the educational process and a connection between the home and school (Etsey, 2005). In addition, due to financial difficulties, students have recently felt the necessity to work while continuing their studies part-time. According to studies on the issue, absenteeism from class is associated with lower performance than attendance (Oduro, & MacBeath, 2003). Additionally, a lot of students think that they are successful for a number of reasons, and their beliefs and passions have a big role in how they react to failure, take chances, and engage with new opportunities. It is undeniable that a number of fundamental factors, effort being the most important of them, affect students' academic success (Tella, & Tella, 2010).

#### **2.4 Teachers Factors**

A teacher who lacks both the academic and professional teacher qualifications would surely have a poor impact on the teaching and learning of his or her topic, according to Agyeman's 2005 assessment. The majority of instructors in the Ghanaian educational system are senior high school graduates who were hired as student teachers to make up for the shortage of trained educators in the primary and junior high schools. Such teachers lack the necessary abilities and instructional strategies for teaching mathematics. When compared to students who are taught by certified, professional teachers, the performance of such teachers' students is not superior (Oduro, & MacBeath, 2003). Agyemang (2005) went on to say that a teacher who is academically and professionally prepared but works in an adverse work environment would be less committed to his job and less productive than a teacher who is untrained but works in a good work environment. Nearly 50% of instructors at the senior and junior secondary levels, according to Oduro and MacBeath (2003), do not have formal training in mathematics education. The majority of instructors in basic education are unqualified to instruct in math and technology. This indicates that a teacher's credentials and area of topic specialty are crucial to the learning and performance of math pupils. Good instructors are familiar with the unique blending of pedagogy and subject. In order to encourage or enhance the learning of that information by various students, Stephenson (2018) said that pedagogical content knowledge pertains to understanding how to provide precise content in a way that is intelligible to students. Most teachers lack the ability to encourage pupils' mathematical thinking. Conversely, pedagogical knowledge is general information about teaching and includes topics like classroom management (Hibbard, 2017). It may not always be clear how pedagogical content knowledge differs from content knowledge since they overlap and build upon one another (Stephenson, 2018). To teach students to comprehend mathematics and perform effectively in it, teachers must have enough material and pedagogical understanding. Lack of motivation is another teacher-related reason to blame for

students' poor arithmetic performance. Since it is the driving force behind human action, motivation is a crucial component of education, one that is linked to real interest, tenacity, and dedication as well as to academic performance (Sekreter, & Doghonadze, 2016). The urge to teach or learn is more or less sparked by motivation in the instructor or pupils (Farr, & Riordan, 2015). It has been demonstrated that teachers' excitement, self-confidence, or self-efficacy affect their conduct, which in turn affects students' motivation and success (Sahakyan, et al., 2018). Additionally, motivated instructors are more adaptable and open-minded when it comes to changes in the educational system (Abós, et al., 2018). Motivated instructors, in particular, have good attitudes and personalities, provide more interesting lessons in the classroom, use a range of teaching methods, and form strong relationships with their pupils (Sekreter, & Doghonadze, 2016). If a teacher's needs are not satisfied, they may experience psychological instability and become unproductive (Asamoah, 2009). Asamoah (2009) said that motivation is the key to raising performance, hence it is important for employers to know what drives their staff members. Ghana's lack of widespread implementation of mathematics teacher motivation prevents instructors from performing to the best of their ability (Asamoah, 2009).

Allen et al. (2018) asserts that as instructors serve as role models for students, their attitudes and beliefs have a significant impact on students' lives. Teachers who have a favorable attitude about mathematics are more likely to instill that attitude in their students (Afif, et al., 2017). Evidence has shown that some teachers' attitudes toward their jobs are reflected in their poor attendance at lessons, tardiness to school, derogatory comments about students' work that could undermine their self-esteem, and ineffective teaching techniques that ultimately have an impact on students' academic performance (Harris, & Bourne, 2017). According to an investigation, pupils who have engaged instructors are brave and motivated to confront the challenges of school life (Keighren, et al., 2017). This implies that in order to inspire pupils to adopt a good attitude toward learning mathematics, teachers must cultivate positive attitudes themselves. Students are organically motivated to learn mathematics and perform better by teachers' attitudes on the topic (Zee, & Koomen, 2016). The majority of math instructors in Ghana do not view mathematics as a profession, and they have a negative attitude about exploring novel teaching and learning techniques. As a result, they consistently employ the same techniques, with the same outcomes.

As noted by Flanders (2009), as a result, education should not be considered as giving information to the students to memorize; rather, it should attempt to create a conducive atmosphere in which students are involved in worthwhile learning activities in order to independently generate knowledge. Teaching is a multimodal information process that includes seeing, touching, feeling, hearing, etc., including the learner in several activities that contribute to knowledge production, according to Odiemo (2015), a lecturer at the University of Nairobi in a psychology class. In Ghanaian classrooms, the teacher-student interaction is dictatorial and impersonal (Anderson, 2010). The author also notes that the fundamental premise for interaction is that students attend school to learn, and as a result, the instructors' job is to tutor them rather than to motivate them to study.

Students aren't treated as thinking individuals with opinions and life experiences that may help them understand the significance of the new knowledge they are learning (Mule, 2007). The author notes that class size has a significant impact on teacher-pupil relations. According to Etsey (2005), a lack of enthusiasm and professional dedication results in low attendance and unprofessional behavior toward students, both of which impair students' academic achievement.

Different discourse motifs are used by math professors to communicate their work. Our schools are dominated by traditional teaching methods that focus on teacher-driven pedagogy (Changeiywo, 2001). The author notes that the majority of secondary schools' learning activities focus on the textbook and sample test questions. According to Linder (2000), how a subject is presented to students may have a detrimental impact on how they perceive it. Teachers' ought to be able to impart knowledge in a way that pupils can put it into practice (Maganga, 2013). The researcher was interested in whether practical mathematics instruction helps students learn the subject, how teachers support their problem-solving, how they engage with the teaching materials, and how the learning settings in schools affect pupils (Maganga, 2013). He advocated for conducting educational activities in the context of the participants' own experiences in his book *Pedagogy of the Oppressed*. Teachers should have discussions with their pupils and assist them in re-labeling or coming up with new concepts (Smith, 2002). This suggests that math instructors should instruct their pupils in the settings in which they actually live. Students might visit fields like farms, football fields, or soccer fields to learn about many types of diagrams in action. Students will be encouraged to remember what they have really learnt as a result. Maganga (2013) claims that Freire pushed for the implementation of the dialogue approach, in which teachers should have conversations with their pupils regarding their learning settings. Instead of utilizing written books and syllabuses in a curriculum of study like what Paul Freire called banking education, the approaches entail students speaking or chatting with one another. Teachers deposit knowledge into students' accounts in a banking-style system of education. According to Bartlett (2008), who acquired this from Freire's work, banking education is a dominance relationship in which the teacher possesses information that he or she deposits in the minds of the pupils who are the passive objects of support.

The issues that hamper pupils' academic achievement in mathematics at the senior high school level are also attributed to teaching experience. Researchers found that inexperienced teachers lack the knowledge and abilities needed to appropriately train children in mathematical concepts. Armstrong (2009) highlighted in his study that teachers who have a specialty in the topic they teach or in the education of that subject and have between 26 and 30 years of teaching experience had a beneficial impact on student performance. Adeyani's (2008) study, which found that instructors' teaching experience was important to students' learning outcomes as evaluated by their performance, is supported by this. Therefore, a student's performance may suffer due to a lack of appropriate teaching experience.

Additionally, research has indicated that one of the factors preventing academic success in mathematics is bad instruction. According to Stuart (2000), inefficient

or bad instruction can be linked to students' low academic achievement in mathematics. Studies conducted in America revealed similar findings when they demonstrated that classroom elements, such as ineffective teaching techniques, influence to mathematical success (Elliot, et al., 2013). According to research, question and answer sessions, exposition, guided exploration, and group projects are the most popular teaching techniques. Research by Dhliwayo and Wadesango (2012) in Zimbabwe found that while field excursions and hands-on activities are not frequently employed, lectures are nonetheless occasionally used.

Additionally, research has indicated that one of the factors preventing academic success in mathematics is bad instruction. According to Stuart (2000), inefficient or bad instruction can be linked to students' low academic achievement in mathematics. Studies conducted in America revealed similar findings when they demonstrated that classroom elements, such as ineffective teaching techniques, influence to mathematical success (Elliot, et al., 2013). According to research, question and answer sessions, exposition, guided exploration, and group projects are the most popular teaching techniques. Research by Dhliwayo and Wadesango (2012) in Zimbabwe found that while field excursions and hands-on activities are not frequently employed, lectures are nonetheless occasionally used. Ale (2000) discovered that 60% of the pupils he spoke with believed their poor math performance was caused by a lack of suitable text materials in their classrooms. Similar remarks were made by Kalejaiye (2005) when he pointed out that teachers require resources and that students and teachers should reference a range of textbooks since they offer various points of view. Similar to this, Ale (2002) shown that certain students' failure to pass their examinations is related to the quality of their school's text materials. Similar discoveries were made by Lance (2002) when he noted that the lack of necessary materials, such as text books, had a negative impact on mathematics as a whole Fagbamije (2004) found in his study that a lack of text books in schools is negatively affecting teaching and learning processes in many nations throughout the world. According to data from the World Bank, the ratio for student text books is 20:1. Due to the financial troubles that were felt in 2007 and 2008. The severely damaged fields were science and mathematics because of a severe teacher shortage in these fields. As a result, inexperienced teachers were hired to fill up the gaps. However, these professors lacked the abilities to instruct students effectively, which led to some of the issues that hamper academic achievement in mathematics. According to Saad (2004), certain mathematics instructors' lack of pedagogic subject knowledge and resources contributes to the poor teaching of mathematics at the secondary level. According to the Gallup Youth Survey conducted in 2004, math is the topic that teens believe to be the most challenging, which may explain for some of the characteristics that tend to impede academic achievement. Teachers must also deal with the misconception that not everyone can succeed in mathematics. One of the privileged few is supposed to be mathematics. Teachers of mathematics have emphasized how pupils frequently view mathematics as a challenging subject. Success, according to researchers, is the greatest treatment for mathematics fear, and it should begin with the instructor.

The results of Iheanachor's 2007 study in Lesotho on the impact of teachers' educational background, professional development, and instructional practices on students' mathematics achievement in Lesotho show a strong positive correlation between students' math performance and math instruction strategies. He stated that factors influencing pupils' mathematical success include instructional strategies, instructor credentials, topic specializations, and years of experience. According to the report, some math instructors have majored in math or math education, while others have majored in other fields but are nevertheless hired as math teachers. This suggests that nearly half of math teachers may not possess the necessary knowledge and abilities to effectively teach the subject. This was made clear in Tanzania between 2006 and 2008 when the government instituted a crash program-style induction session (SEDP, 2010). The program resulted in poorly qualified instructors because students only attended for a month before being sent to work in schools. According to research by Tshabalala and Ncube (2013), the key factors influencing students' math performance were their foundation in the topic at lower levels, their dread of the subject, and the way teachers taught. Students' performance in mathematics was significantly predicted by mediating variables such as attitudes toward mathematics, the perceived relevance of mathematics, and the amount of time spent on homework in mathematics.

Teachers are expected to include pupils in a variety of problem-solving activities that lead to learning in competence-based curricula. Mtitu (2014) has evaluated the application of learner-centered teaching strategies as mandated by the competence-based curriculum from 2005. Even though the subject of his study was Geography, it was advised that the strategy be used while teaching all other disciplines, including mathematics. However, it was found in this study that teachers dominated the majority of their instructional techniques in the classroom. Effective guidance and facilitation of pupils' group activities when teachers put them in groups was conspicuously lacking. According to Mtitu, a curriculum must be adapted to the daily lives of both teachers and pupils.

### **2.5 Parental Factors**

According to Okyerefo et al. (2011), the home has a variety of functions that support students' academic performance at school. Parents play the primary role in the household, with help from other major family members including siblings, uncles, and aunts among others. Different parenting practices result in varied ways to connect with kids, and each of these ways plays a significant role in forming the kids' worldviews. For instance, several studies have found that between the ages of six and ten, when kids are often in school, parents spend less time with their kids. Socioeconomic status, which is typically defined by a combination of characteristics including parents' educational attainment, employment status, and income level, is another crucial part of the home environment (Jeynes, 2002). Unsurprisingly, socioeconomic class is cited as a key predictor of academic performance in the majority of studies on students' academic performance. For instance, students who have access to materials like mathematics textbooks and who use after-school activities like including them in math lessons after school tend to do better in arithmetic (Stipek, et al., 2017). The majority of parents have negative attitudes regarding mathematics education, and

some parents have weak mathematical backgrounds, which makes it difficult for them to support their children at home, according to Burt (2017). Parents' jobs have an impact on their children's academic success as well. Children from wealthy homes are more likely to enroll in school at an early age and receive the finest support for their educational needs. However, students from more affluent backgrounds often struggle with issues including the inability to pay for uniforms, exercise books, and inadequate textbooks. All of these emotions drain the child, decreasing their motivation to excel in school (Sattin-Bajaj, et al., 2018).

According to Schiller et al. (2002), parents with higher levels of education tend to be more capable of giving their kids the social and academic support necessary for academic achievement. This indicates that parents who neglect to give their kids intellectual and social support place their kids in tough situations, which prevents them from performing better. It is considered that a student's academic success is influenced by how many siblings he or she has (Askhia, 2010). When a family is larger, parents are less likely to give their whole attention to the child and have greater difficulty satisfying the child's physical and emotional requirements, especially during this time of austerity when the cost of food and other necessities is skyrocketing (Askhia, 2010).

Regular absentee students perform less academically and could receive poorer test results as a result (Barker, & Jansen, 2000). According to Lotz and Lee (1999), prolonged absences may have an impact on retention since they run the risk of turning into truancy. The study also showed that kids with poor grades, inconsistent attendance, and later dropout rates are more likely to engage in delinquent behavior. It was predicted that cutting excessive absenteeism in the commonwealth's public schools by 25% would enable 22,000 more young pupils to perform better than the average on standardized examinations (Applegate, 2003). Additionally, studies show that schools with higher attendance rates had students who performed better on tests regardless of socioeconomic and economic variables (Applegate, 2003). According to Dampson and Dominic (2010), children's attitudes toward education and challenge are influenced by their parents' unwavering fortitude and resolve to persevere in the face of any obstacles. According to research by Etsey (2005), some of the reasons for some Ghanaian public schools' poor academic performance include parents' inability to address the fundamental requirements of their children, attend Parent-Teacher Association (PTA) meetings, and communicate with their children's instructors. The performance of the child is negatively impacted by the inability to offer basic school necessities such textbooks, supplemental readers, food to eat before going to school, and school uniforms, among others.

Parental or familial characteristics are one of the main elements explored when predicting academic achievement in the majority of studies on the academic performance of students. Most frequently, parental and family factors are calculated by adding the parents' income, occupation, and educational attainment (Jeynes, 2002). According to Graetz (2005), a person's ability to succeed in school is significantly influenced by their parents' socioeconomic standing. According to Considine and Zappala (2002), children who grow up in privileged social, educational, and financial families are more likely to accomplish highly. Smith

(2004) asserts that a student's familial background affects how well they perform in mathematics and that students' cultural origins can have an impact on their motivation to study the subject. Furthermore, based on parental experiences, mathematical interests, and cultural perspectives and attitudes toward mathematics education, pupils from various cultural backgrounds are influenced in different ways. In their TIMSS (Trends in International Mathematics and Science Survey) study conducted in the US and Australia, Limb & Fullarton (2001) discovered that students from single-parent families, as opposed to those with two parents, tend to have better achievement levels in mathematics. Students from English-speaking homes perform better in arithmetic than students from other languages. More homework assignments from the teacher are correlated with better success in the class. They agreed that grouping techniques used by teachers influence the learning settings in the classroom and enhance student achievement. Smith (2004) asserts that family background affects how well students succeed in mathematics and that students' cultural origins can have an impact on their motivation to pursue the subject. Furthermore, based on parental experiences, mathematical interests, and cultural perspectives and attitudes toward mathematics education, pupils from various cultural backgrounds are influenced in different ways. Furthermore, according to Smith's research, students who are studying higher-level mathematics are affected in a different way than students who are learning lower-level mathematics or who decided not to study mathematics at all. The effect of students' home environments on achievement is one of the most constant and frequently documented phenomena in the world of education (Sirin, 2005). Students who have parents with higher socioeconomic position likely to perform better academically than students whose parents have lower levels of education, more prominent jobs, or larger incomes.

## **2.6 Chapter Summary**

This chapter described the theoretical framework that made assumptions about the elements that impede students' academic performance in mathematics. With the help of a review of theoretical literature, these presumptions have been further clarified. It was discovered that the relationship between students' performance and the first component was the instructor, which included teaching philosophies, subject-matter expertise, instructional tactics, classroom management, communication abilities, and personality. The second was the student component, which included study practices, time management, attitude, and mathematical interests. The performance of a child's ward and peer group is influenced by socioeconomic factors such the values and attitudes of their parents, who come in third.

## METHODOLOGY

### 3.0 Overview

The research methods and strategies that will be employed to carry out this study were outlined and detailed in this chapter. It began by outlining the research design and the tools used for data gathering. Additionally, the study's population and sample were explained. Data gathering techniques, data validity, and data reliability issues were discussed.

### 3.1 Research Design

Omari (2011) claims that a research design is a specific strategy for approaching an issue. By examining a sample of that group, a survey design can quantify or numerically describe the trends, attitudes, or opinions of that population (Creswell, 2013). The research generalizes or assumptions about the population based on sample data. In this study, cross-sectional survey was used. The Kassena-Nankana Municipality's secondary schools were therefore surveyed by the researcher. In order to systematically explore the issues affecting students' academic performance at the mathematics topic in the Senior High Schools in the Municipality, mathematics teachers, students, academic masters, and head of schools were all involved. The study, however, included both quantitative and qualitative research methods. The problem was quantified using a quantitative method by creating numerical data and turning it into useful statistics. The population's views, opinions, behaviors, and other defined factors were studied using a qualitative technique.

### 3.2 Area of Study

Based on variables that lower pupils' academic performance in mathematics in the Upper East Region, this study was conducted. Ghana. The Kassena-Nankana Municipality was chosen as the study's location.

### 3.3 Population

The broad group of people who share one or more characteristics with the research study's topic serves as the sample's target population (Kothari, 2004). Teachers, students, and educational officials in the Kassena-Nankana Municipality were the study's target group. Records kept by the Municipality office in the year 2022 show that there was a total of 24 Secondary Schools in the Municipality. Students from Navrongo Senior High School, St. Benedict Senior High School, and other schools were the focus of the study. Given that they are also in the teaching profession and run across issues related to students' performance in mathematics, mathematics instructors were also given the chance to provide their opinions on the elements that likely to limit students' academic success.

### 3.4 Sample and Sampling procedures

In this survey, respondents were pupils, but opinions from math instructors and school parents in Kassena-Nankana Municipality were also considered. Students were chosen at random. A total of eighty-one (81) students were selected from the Municipality's St. Benedict Senior High School and Navrongo Senior High School. Two pupils from each of the sampled schools were selected by the researcher. This group of pupils was selected since it was thought that form two students had practically studied the entirety of the mathematics curriculum. The

form two streams in streaming sample schools were chosen using simple random sampling. From the list of Form Two students, twenty-eight (28) male and thirteen (13) female students from St. Benedict Senior High School/Technical and twenty-three (23) male and seventeen (17) female students from Navrongo Senior High School were selected. The two sample schools yielded a total of eighty-one (81) pupils for the sampling. The sample size of the Municipality's sampled schools is shown in the chart.

**Chart 1: The sample size of the Municipality's sampled schools**

Sample	Male	Female	Total
St. Benedict Senior High School, School,	28	13	41
Navrongo Senior High School.	23	17	40
<b>Total</b>	51	30	81

### 3.5 Data Collection Instruments

For this study, the researcher used primary data collection tools. Primary data was gathered via questionnaires, focus groups, interviews, and observations. Students responded to questionnaires that were utilized as the primary instrument for the study's data gathering. The questionnaires included several closed-ended questions and 5- and 4-point Likert scales to gauge the appropriateness of the mathematics material. Each of the following categories had to be checked by respondents: 5, Strongly Agree (SA), 4, Agree (A), 3, Neutral (N), 2, Disagree (D), and 1, Strongly Disagree (SD).

### **3.5.1 Interview**

Interviews can be held in-person, online, over the phone, and occasionally with the help of laptop computers. The researcher spoke with parents and instructors for this study. The data was contrasted and compared to data gleaned from previous interviews. The same inquiries had to be made during each interview in order to accomplish this. However, the interview was still open-ended, which greatly aided in exploring other pertinent material that came up during the interview. The study's appendices contain the interview questions.

### **3.5.2 Observation**

When a researcher wishes to become fully immersed in a particular culture to develop a deeper knowledge, they use participant observation. Using observational methods, the researcher must manually or with the use of recording or measuring tools, according to Blessing and Chakrabarti (2002). In this study, the following topics were observed: teaching style and how math teachers conduct their lessons, use of instructional strategies in classrooms, and various book types. Additionally, observations were taken regarding the use of teaching aids, how well students engaged in the learning process, what they did and how they felt about arithmetic, as well as the classroom settings in which instruction took place.

### **3.5.3 Documentary Review**

Documentary research refers to the utilization of outside documents and sources to bolster a thesis or argument in a written academic work (Omari, 2011). The following documents were reviewed for the research: textbooks, student-owned learning materials, mathematics files, mathematics syllabus, mathematics books, continuous assessments, external and internal examination files, performance analysis files, and mathematics files.

### **3.6 Validity and Reliability of the Study**

Prior to the actual data collection, the researcher conducted a pilot study to determine the validity of the instruments used. By giving the tools to students who are aspiring instructors, the instruments were put to the test. The instruments were provided to the project manager for additional feedback and improvement; as a result, all essential revisions were done and any components deemed inappropriate were eliminated. Some of the questions in the questionnaires, focus group talks, and interviews were asked to the respondents more than once to determine whether there is consistency in their responses. This was done to ensure the dependability of the information gathered.

### **3.7 Data Analysis Procedures**

Data analysis, according to Kothari (2004), entails the editing, coding, classification, and tabulation of gathered data. The procedure includes steps that are taken in order to organize and summarize the field data that have been gathered. The study used both qualitative and quantitative data, therefore there were two approaches to analyze the data. For quantitative data, the researcher first used Microsoft word Excel. This software is used to analyze data that has a quantitative component. In this study, the software was used to analyze data obtained through a questionnaire. Data had to be coded, sorted, and conclusions had to be made. Second, in order to extract pertinent information, the qualitative data collected through interview, observation and documentary reviews was

processed. This made it easier for the researcher to describe the information gathered in the field and draw conclusions based on what was considered to be helpful.

### 3.8 Ethical Consideration

The researcher was mindful of research ethics and its ideals when gathering the study's population, gathering data, and disseminating the results. The university's head of the department for mathematics and science education provided the researcher with a letter of authorization to do research.

### 3.9 Chapter Summary

The purpose of this chapter was to introduce research techniques with a focus on issues that interfere with senior high school students' academic performance in mathematics in the Kassena-Nankana Municipality. The research design, study areas, population, sampling method, sample size, data collection tool, document review, validity and reliability of study, data analysis methods, and consideration of ethical issues have all been discussed in the chapter in sequential order.

## RESULTS AND DISCUSSION

### 4.0 Overview

The study's findings are presented in this chapter after being examined using descriptive and inferential statistics. The presentation of the study outcomes based on the objectives follows a description of the demographic features of the sampled groups.

### 4.1 Demographic Information on Student responses

The demographic breakdown of the student participants is shown in this section. These include the participants' student participants' gender and age range.

**Table 1: Students Demographic Information**

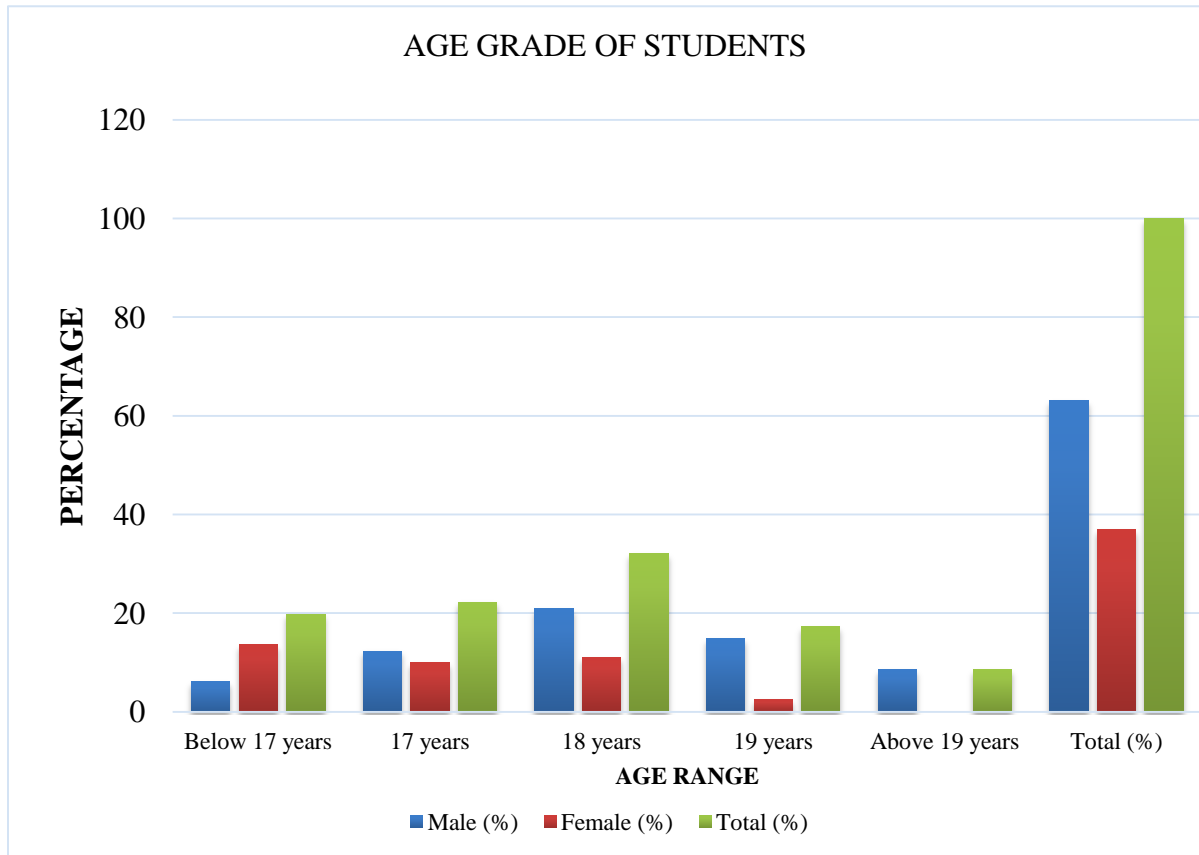
Age grade	Male (%)	Female (%)	Total (%)
Below 17 years	6.2	13.6	19.8
17 years	12.3	9.9	22.2
18 years	21.0	11.1	32.1
19 years	14.8	2.5	17.3
Above 19 years	8.6	0.0	8.6
Total (%)	63.0	37.0	100.0

**Source: Resource Findings**

According to Table 1, 63% of the respondents among the students are men. 6.2% of them sixty-three percent are under the age of seventeen. 12.3% of people are 17 years old, 21% are 18 years old, 14.8 are 19 years old, and 8.6% are over the age of 19. The remaining 37% of people are female, with 13.6% being under the age of 17, 9.9% being over the age of 17, 11.1% being over the age of 18, and 2.5 being over the age of 19. None of the women were older than 19 years old. A total of 19.8% were under the age of 17. 17.3 were 19 years old, 32.1% were 18

years old, 22.2% were 17 years old, and 8.6% were beyond the age of 19, totaling one hundred percent (100%) in total. The figure below shows how this is done.

**Figure 2: Age grade of students**



**Objective 1: Students Factors**

**Table 2: Students’ personal factors that affect their performance in mathematics**

Statement	Mean	SD	Rank
I do not like mathematics	2.3	1.3	6
Mathematic is not interesting to students	3.4	1.3	2
I am not motivated to study mathematics	3.1	1.3	4
I mostly skip mathematics classes	2.4	1.4	5
Lack of learning material discourage me from learning mathematics	3.3	1.4	3
School environment is not conducive for studies in mathematics subject	3.4	1.5	1

**Source: Resource Findings**

Table 2 lists the qualities of students in the Kassena-Nankana Municipality that are detrimental to their academic achievement in mathematics. This study discovered that, despite mathematics having the highest rank (M=3.4, SD=1.5), the learning environment in schools is not favorable for its study. The study found that, as the subject with the second-highest rank (M=3.4, SD=1.3), mathematics is not engaging to kids. The absence of instructional materials, which deters pupils from learning mathematics, a lack of motivation, and the third and fourth rankings with (M=3.3, SD=1.4) and (M=3.1, SD=1.3), respectively, are followed by this. The study, however, showed that pupils do not in fact skip math sessions, with M=2.4 and SD=1.3. The results of this study refute the notion that students dislike mathematics from a financial perspective. listing ranked factors with (M=2.3, SD=1.3) as appropriate.

**Objective 2: Teachers factors**

**Table 3 Teachers factors that hinder mathematics performance**

<b>Statement</b>	<b>Mean</b>	<b>SD</b>	<b>Range</b>
Mathematics teachers absent themselves from school	3.0	1.5	5
Teachers do not effectively use their instructional time	3.4	1.4	6
Language used by mathematics teachers is difficult for me to understand	2.6	1.3	2
Mathematics teachers Punish students when they fail mathematics in school	2.3	1.2	1
No enough mathematics teaching and learning materials in school	2.8	1.3	4
The period for mathematics lessons is not enough	2.8	1.3	3

Table 2 lists the teacher-related factors that negatively affect students' academic performance in mathematics at particular senior high schools in the Kassena-Nankana Municipality. The majority of students (M = 3.4, SD = 1.4) agreed that mathematics teachers do not effectively utilize their class time. Students who responded disagreed that there aren't enough math professors in the classrooms and that there aren't enough math classes each week (M=2.8, SD=1.3). Students disagreed with the idea that teachers punish them when they fail a mathematical subject with a (M=2.3, SD=1.2) the lowest rank factor was, students disagreed with the idea that mathematics teachers typically absent themselves from school.

**Objective 3: Parental or family factors**

**Table 4: Parental or family factors that affect students' performance in mathematics**

<b>Statement</b>	<b>Mean</b>	<b>SD</b>	<b>Rank</b>
Parents do not monitor my progress in mathematics performance	3.5	1.4	1
Parents do not motivate me to study mathematics	3.1	1.3	6
Parents are unable to provide me with essential mathematics learning materials	3.1	1.4	6
The Parent-Teacher Association (PTA) of my school is not effective	3.3	1.2	3

I mostly assist my parents in their economic activities instead of learning	3.1	1.5	6
Large family size affects my mathematics performance negatively	2.8	1.4	8
Parents do not assist me doing my mathematic assignment	3.3	1.4	2
I have less financial support from parents when I am in school	3.2	1.4	4

**Source: Resource Findings**

In the Kassena-Nankana Municipality in Ghana's Upper East, Table 4 lists several parental or family characteristics that negatively affect pupils' academic achievement in mathematics. Results in this section showed that parents of students do not actually follow their wards' development. (M=3.5, SD=1.4) According to a study (M=3.3, SD=1.4), parents do not encourage their children to solve math problems. With (M=3.3, SD=3.3), the Parent Teacher Association (PTA) was ineffective. Additionally, a common mean (M=3.1) and (SD=1.3, SD=1.4, SD=1.5) were used to identify motivation, the incapacity to provide their wards with educational materials, and the usage of pupils for economic activity. The students disagreed with the least-ranked item (M=2.8, SD=1.4).

**4.2 Discussions**

Regarding student characteristics, the study discovered that students' performance in mathematics was adversely impacted by their lack of willingness to learn the subject. The results of this study are consistent with those of Engin-Demir (2009), who discovered that pupils' poor arithmetic performance is a result of their teachers' and parents' lack of passion. Additionally, it was shown that a lack of learning resources deters pupils from studying mathematics. Parents should assist their children in their studies of mathematics by providing them with the learning tools they will require in school.

Students don't find mathematics to be particularly intriguing. The results of this study are consistent with those of Akey (2006), who discovered that students' attitudes toward mathematics affect the efforts they make to comprehend and practice mathematical concepts and skills, and that their perceptions that math is boring and difficult have a negative impact on their performance. In order to instill in their students, the confidence and positive attitude they need to study the subject, teachers of such kids must devise techniques to dispel such misconceptions about the subject. The survey also discovered that student absenteeism is not very high. The results of this study contradict those of Etsey (2005), who claimed that students frequently miss class, particularly on market days, to work to augment their family's income or because of peer pressure. Lack of teaching and learning resources in schools was one of the problems that instructors in the Kassena-Nankana Municipality identified as impeding students' math performance in the selected Senior High Schools. The results of this study are consistent with those of Ministry of Education (2008), which stated that physical resources, such as books, stationery, furniture, equipment, and recreational areas, are essential to an effective education and that students perform better when they have access to these resources because they are tools that

encourage learning. Ministry of Education (2008) came to the additional conclusion that pupils do badly in mathematics in schools that lack teaching and learning resources. The results of this study also corroborated those of Okyere et al. (2011), who discovered that a shortage of textbooks, curricula, and other basic resources in the majority of schools is a factor in students' subpar math achievement. It is crucial for education stakeholders to offer instructional resources to boost students' math proficiency. Teachers' absences from class were one of the issues this study highlighted as a hindrance to students' ability to perform better in mathematics. The results of this study are consistent with those of Etsey (2005), who claimed that teachers' tardiness and absenteeism cut down on teaching time and lead to incomplete syllabi, which in turn causes students to do poorly in mathematics. The attendance of teachers must be rigorously monitored by school administration, and these unsavory traits in some teachers must be reined in.

According to this study, one reason why students in the Kassena-Nankana District perform poorly in school is because their parents employ them for economic purposes rather than for academic ones. The results of this study concur with those of Akey (2006), who discovered that parents with poor socioeconomic level permit their kids to engage in economic activities rather than attend school. This promotes student absenteeism and allows for a lack of focus in the classroom, which has a negative impact on students' math performance. The study found that poor student performance in the Kassena-Nankana Municipality can be caused by parents' failure to assist their children in solving mathematical issues. The results of this study confirm Schiller et al. (2002)'s contention that parents with higher levels of education look better able to give their children the intellectual and social support necessary for scholastic achievement than parents with lower levels of education. According to Schiller et al. (2002), educated parents assist their children with their homework and give them the resources they need to learn, which improves these students' academic performance. This means that parents who don't give their kids academic and social assistance place their kids in tough situations, which prevents them from doing better in math. Ineffective Parent-Teacher Associations (PTA) of schools were also identified in this study as a contributing factor to pupils' subpar arithmetic performance. This study's findings were consistent with those of Etsey (2005), who found that some factors contributing to the poor academic performance of some Ghanaian public schools include parents' inability to meet the basic needs of their children, participate in Parent-Teacher Association (PTA) meetings, and communicate with their teachers.

## **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

### **5.0 Overview**

This chapter discusses the findings and how they relate to the overarching theoretical framework, as well as offers conclusions, suggestions, and potential future study directions.

### **5.1 Summary**

The study's goal was to determine what challenges students' academic performance in mathematics at particular senior high schools in the Kassena-Nankana Municipality. According to the study, factors that affect pupils' academic performance negatively include teacher-related factors, personal characteristics of the students, and parental influence. In this study, it was shown that students had traits such as a lack of enthusiasm in studying mathematics, a lack of financial resources, and a lack of learning resources that discouraged them from learning the subject. Among other things, instructors' inefficient use of their instructional time and teacher absence were variables impacting pupils' poor academic achievement in mathematics.

In the Kassena-Nankana Municipality, parental or family-related factors that hampered the academic performance of their wards in mathematics included: parents' inability to approach the school to inquire about how their wards are doing in mathematics; parents' inability to provide their wards with the necessary instructional needs for mathematics studies; schools' ineffective Parent Teacher Associations (PTAs); and parents' lack of encouragement for their children to study mathematics.

### **5.2 Conclusion**

The results of this study demonstrated that in the Kassena-Nankana Municipality in Ghana's Upper East Region, parents, instructors, and students' attitudes have a stronger impact on students' academic achievement at the Senior High School level. Based on the findings, the researcher draws the conclusion that students are interested in mathematics because neither their professors nor their parents have encouraged them to pursue it as a subject of study. Students are discouraged from studying mathematics due to inadequate financial assistance, a lack of resources for learning the topic, and teachers' failure to effectively use their class time.

### **5.3 Recommendations**

Based on the findings and conclusions drawn, the following recommendations are made for policy and practice:

The creation of an environment that is conducive to learning and teaching, including individual studies by students. To boost their students' interest in mathematics, math teachers should develop the usage of teaching aids and mathematical models. Parents, instructors, the ministry of education, and school administrations should encourage pupils to study mathematics. To supplement the supervisory role of the head teachers and promote more teacher accountability, intensive supervision from the Municipal directorate and circuit supervisors is required. Without fear or favor, absence among teachers should be recognized and subject to the appropriate consequences. The involvement of parents in their

children's education should be promoted. In order to build a platform for addressing students' welfare, the Parent-Teacher Association (PTA) needs to be strengthened. Parents should make every effort to give their children the necessary financial support.

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## APPENDIX

### QUESTIONNAIRE FOR STUDENTS

I am a graduate student at the University for Development Studies pursuing Bachelor degree in Mathematics Education. I am conducting research on factors that hinder the academic performance of students in mathematics in Kassena-Nankana Municipality.

#### Guide

- The questionnaire is in two sections and kindly respond to all sections approximately.
- Do not write your name anywhere in this paper.
- Please respond by putting a tick [✓] for the information required in each item and where necessary kindly provide the additional information as may be needed.
- The information you provide will be kept confidential.

#### SECTION A: DEMOGRAPHIC DATA

- 1. Gender:** Male   
 Female
- 2. Age:** Below 17 years   
 17 years   
 18 years   
 19 years   
 Above 19 years

#### Section B: Information about Teaching Mathematics

Read the following statements and indicate the extent you think they are true from your own experience by putting a tick [✓] in an appropriate place.

5. Strongly agree (SA), 4. Agree (A), 3. Neither (N), 2. Disagree (D), 1. Strongly Disagree (SD)

Statement	Response				
	SA	A	N	D	SD
Teachers absent themselves from school					
Teachers do not effectively use their instructional time					
Teachers do not use of suitable methods for teaching the subject					
Teachers are motivated to teach					

Language used by the teachers is difficult for students to understand					
Teachers Punish students when they fail mathematics in school					
Class size are too large					
Mathematics teachers have high workload and larger content of syllabi					
No enough mathematics teaching and learning materials in school					
The hours allocated for teaching mathematics are not enough					

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Read the statements below and indicate the extent you think they are true from your experience. Check how you agree with the statements by putting a tick [✓] in an appropriate place.

5. Strongly agree (SA), 4. Agree (A), 3. Neutral (N), 2. Disagree (D), 1. Strongly Disagree (SD)

Statement	Responses				
	SA	A	N	D	SD
I do not like mathematics					
Mathematic is not interesting to students					
My parents do not parents assist me in doing mathematics assignments					
Students are not motivated to study mathematics					
Students skip classes					
Lack of learning material discourage me from learning mathematics					
Limited financial support from parents					
No enabling environment for the study of mathematics subject					

Read the statements below and indicate the extent you think they are true from your experience. Check how you agree with the statements by putting a tick [✓] in an appropriate place.

5. Strongly agree (SA), 4. Agree (A), 3. Neutral (N), 2. Disagree (D), 1. Strongly Disagree (SD)

Statement	Responses				
	SA	A	N	D	SD
Parents do not monitor the progress of their wards in mathematics performance					
Parents do not motivate their ward to study mathematics					
Parents are unable to provide wards with essential instructional needs for mathematics studies					

The Parent-Teacher Association (PTA) of my school is not effective					
Parents use of students for economic activities instead of learning					
Larger family size affects their mathematics performance negatively					
Parents support their ward financially when in school					

UNDER PEER REVIEW