UNIVERSITY OF EDUCATION, WINNEBA

FACTORS INFLUENCING ATTITUDES TOWARDS MATHEMATICS AMONG JUNIOR HIGH SCHOOL STUDENTS IN SAMREBOI CIRCUIT, GHANA

LOUIS SAVIOUR MENSAH

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LOUIS SAVIOUR MENSAH

A dissertation in the Department of Educational Foundations, Faculty of Educational Studies, submitted to the School of Graduate Studies, in partial fulfillment

of the requirements for the award of the degree of Post Graduate Diploma (Education) in the University of Education, Winneba

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DECLARATION

Student's Declaration

I, Louis Saviour Mensah, declare that this dissertation, 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 dissertation as laid down by the University of Education, Winneba.

Dr. Daniel Buku (Supervisor)

Signature: …….…….....

Date: …….....

DEDICATION

To my mother, Rose Gyetuah and my father Samuel Brew who have always been my anchor. May God richly bless you.

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My foremost thanks go to the Almighty God for granting me strength, good health and all it takes to write this piece of work. I also wish to express my sincere appreciation to my supervisor, Dr. Daniel Kwabla Buku a senior lecturer at the Department of Counselling Psychology, University of Education, Winneba who in spite of his busy schedules supervised this project, read through and made valuable suggestions which have made this work a success. May the Almighty God continue to bless him.

I am highly indebted to my cousin Ebenezer Jonson and my brother Luther Kwesi Mends for their support in diverse ways for a successful completion of this work, and to every other person involved in the success of this work, may God bless you.

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ABSTRACT

This study examined factors that influence the attitude of students towards the learning of Mathematics among Junior High Schools in Samreboi circuit. A quantitative study using the cross-sectional survey research design was adopted for the study with a population of 1200 second year Junior High School students. The simple sampling technique was used to select 180 respondents for the study. A structured questionnaire designed by the researcher on a 4-point Likert scale was used to collect the quantitative data. Mean and standard deviation was used to analyse research questions 1, 2 and 3 while independent sample t-test was used to analyse the fourth research question. The research instrument was validated through my supervisor who is expert in the field and pre-test was used to check the its reliability. The study revealed that the poor attitudes of students towards the study of mathematics is not associated with parental influence. The study also revealed that the positive attitudes of teachers towards teaching and learning positively influenced students‟ attitude towards the study of the subject. It was concluded that though the students disagreed that factors relating to the home or family as far as their parents are concerned do not influence their attitudes, several studies have established a positive correlation between family characteristics and students‟ attitude formation. The study also revealed a positive relationship between teacher factors and students‟ attitude formation towards Mathematics. It was recommended that the education directorate should organise a sensitisation workshop for parents/guardians to educate them on their influence on the attitude formation of their wards towards Mathematics.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Mathematics is a science of structure, order and relation that has evolved from elementary practices of counting, measuring and describing the shapes of objects (Gregersen, 2018). It deals with logical reasoning of objects and quantitative calculation, and its development has involved an increasing degree of idealization and abstract of its subject matter. Mathematics has been an indispensable adjunct to the physical sciences and technology, and in the more recent times it has assumed a similar role in the quantitative aspects of the life sciences (Gregersen, 2018). In this regard, worldwide, mathematics can be seen as the base for scientific and technological knowledge that is important for socio-economic development of nations.

The idea of Keith (2012) indicates that technology and computer applications use different types of mathematics that are available in education, entertainment and work. As such, digital processing is based on Boolean algebra and statistics are used for basic research which fuels the development of new technology. This signifies that mathematics is an important tool in the development of technology which has a profound effect in our daily lives. To answer the question, “Does our technology control us?” Nunzia (2017) found out that technology simplifies and enhances our lives each day because we live in a fancy, high tech word. According to Amazingo (2002), the place of mathematics cannot be over stated because it is linked to the development of any nation. Goldin (2000) acknowledges that mathematics is useful in other disciplines and is one of the subjects used to select applicants for a particular career or course.

To support the assertion of Amazingo, Roohi (2012) expresses that mathematics play a major role in personal and societal development. Such that at the personal level, it develops the person intellectually, vocationally, morally, spiritually, and culturally. She emphasizes that mathematics helps in developing society through education system, economics, infrastructure, science, medicine, agriculture, culture and societal morals. This means that for nations develop, there should be a personal development which will affect societal development and that goes on to affect the entire nation and that mathematics plays a role.

However, mathematics is one of the most important school subjects in the curriculum worldwide. The Ontario Curriculum for mathematics Grade 1- 8 (2005) denotes that, the study of mathematics equips the student with knowledge, skills and habits of mind that are essential for successful and rewarding participation in such a society and also powerful means of communication. Notwithstanding to that, the Ghana Education Service Curriculum for mathematics (2009) establish points that mathematics forms integral part of our everyday lives and that the universal truth hinged on mathematics is the backbone of social, economic political and physical development of a country. It also asserts that it is a body of knowledge which attempts to explain and interpret phenomena, and experiences.

It is a subject that has a direct relationship with other subjects, particularly technical and sciences. It is a subject that cuts across primary, junior high schools and senior high schools as a compulsory subject in Ghana. Umameh, in Tshabala and Ncube (2013), was of the view that mathematics is a bedrock and an indispensable tool for scientific, technological and economic advancement of any nation. In addition to that, Davies and Hersh, (2012) see mathematics as the important subject not only

from point of view of getting an academic qualification at school or college, but also is a subject that prepares the students for the future as well irrespective of which work of life, they choose to be part of. Mefor (2014) summarized it all by saying that mathematics relates to everything in the universe from the smallest to largest. Umameh (2011) added that mathematics is intimately connected to daily life and everybody‟s life-long planning. Therefore, mathematics is a subject that education and human life cannot function effectively without it.

However, in Ghana mathematics is compulsory a subject in the pre tertiary education and a requirement in the tertiary admission. Meanwhile, student‟s attitude about mathematics is a major factor that affects his or her attainment and realization of full potential. Neale (2009) defines attitudes towards mathematics as "alienated measures of like or disliking of mathematics, a tendency to engage in or avoid mathematics activities, the belief that mathematics is useful or useless". Several important components emerge from these definitions: attitude is learned, it influences one to take a slated or implied altitude or to have such an attitude as a result of prior influences that may be either positive and there is response consistency. On the same note, Aiken (1996) defines attitude as "a learned predispositions or tendency on the part of an individual to respond positively or negative to some objects, situation, concept or another person.

Teacher's attitudes towards mathematics could presuppose an inclination to pass on what they have received as a duty or as a valuable asset of knowledge that could be beneficial in their learners. On the contrary the learner‟s altitudes towards mathematics could be valued in relation to natural disposition, environmental exposure, scales of value or personal disposition, which needs investigation to

establish the missing link in the achievement of mathematics. Attitudes are regarded by several researchers, as an important factor to be taken into account when attempting to understand and explain variability in student performance in mathematics. Mobilizing a set of different definitions concerning attitudes presented since 1935, Eshun (2007) defines an attitude towards mathematics as "a disposition towards an aspect of mathematics that has been acquired by an individual through his or her beliefs and experiences but which could be changed". When emphasizing the importance of individual experiences, the contexts where students interact with others and with mathematics become important focal points. According to Reid (2006), attitudes express our evaluation of something or someone. They are based on our knowledge, feeling and behaviour and they may influence future behaviour. Attitudes are highly composite and they can affect learning comprehensively. Attitudes influence performance and performance in turn influences attitudes.

According to Fishbein Model of value – expectancy (Fishbein, 1975) argued that a person‟s attitude determines his/her intended behaviour, which could ultimately affect the outcome. Based on the model, he stated that a person would hold certain attitudes towards an object by evaluating it. After going through his process, the person then decides whether to hold a favourable or unfavourable view towards it. Indeed, such a positive or negative attitude could further influence the person‟s intentions to engage in various behaviours with regard to that particular object (Fishbein & Ajzen, 1975). Based on the person‟s behaviour, this could be regarded as a significant predictor of the final outcome. Attitudes will affect behaviour, influencing what the learner selects from the environment, how he/she will react towards teachers, towards the material being used and towards the other students.

In particular, Ajzen and Fishbein‟s (1980) theory of reasoned action, which is concerned fundamentally with predicting behaviour focuses on the distinction between attitudes towards some object and attitudes towards some specific action to be performed towards that object (e.g., between attitudes towards science and attitudes towards doing school science), Ajzen and Fishbein (1980) argue that it is the latter kind of attitude that best predicts behaviour. Thus, their theory represents a relationship between attitude, intention and behaviour. Behaviour is seen as being determined by intention, and intention, in turn, is a joint product of attitude towards the behaviour and the subjective norm (i.e., beliefs about how other people would regard one‟s performance of the behaviour).

The question in this study is what influences attitudes towards mathematics among students in junior high schools. Theoretical arguments have it that, there are indeed numerous researches conducted on testing the relationship between attitude and academic achievement. Based on the past literature, there has been a general consensus that attitude could be regarded as a significant predictor of one‟s academic achievement. Most of these researches illustrated the more positive one‟s attitude towards academic subject, the high the possibility for him or her to perform well academically.

In pursuit for solution, earlier research by Miheso (2003), Munyao (2003) and Nyambuka (2004) investigated on Mathematics teaching methodologies and language factors, and gender disparities all in relation to performance. In a research done by Kate Christian, Morrison and Brayn (2002), determined that family education level and childcare environment could influence student‟s attitude in Mathematics learning. Fraser and Kahle (2008) have also highlighted this aspect in research which shows

that learning environments at home, at school, and within the peer group accounted for a significant amount of variance in student attitudes and, furthermore, that class ethos had a significant impact on the scores achieved by students for these attitudes. Attitudes can be seen as more or less positive.

A positive attitude toward mathematics reflects a positive emotional disposition in relation to the subject and, in a similar way, a negative attitude towards mathematics relates to a negative emotional disposition. Mubeen et al (2013) (in their journal of humanities and general sciences) on attitude towards Mathematics and academic achievement, points out that in order to succeed in a subject, positive attitude towards the subject is a necessary prerequisite. For this reason, positive attitudes towards mathematics are desirable since they may influence one‟s willingness to learn and also the benefits one can derive from mathematics instruction.

According to Manzo (2008), teachers should motivate students that do not receive necessary support from home. Furthermore, this motivation is mostly easily incorporated into elementary classrooms because by middle and high school, students have more solidified attitudes (Manzo, 2008). Lack of motivation could mean an apathetic attitude or lack of self confidence in school. In their research, Fisher and Rickards (1998) found that students‟ attitude towards Mathematics tend to be more positive in classroom where students perceived greater leadership and helping or friendly behaviours in their teachers and more in their classrooms where students perceived their teachers as admonishing and enforcing strict behaviours.

Despite findings of girls‟ low confidence in mathematics, studies of classroom environment have shown that the girls‟ confidence in mathematics have improved

greatly in classes which actively involved girls in the learning of mathematics (Boaler, 2000). Similarly, Bolaji (2000) conducted a study that examined the influence of student's attitude towards mathematics in the junior secondary school. A random sample of 280 students was used. The research design employed was case study. Students‟ questionnaire was the only instrument used to collect data. If the instruments were triangulated a more in- depth understanding of the case could be gained. The study used descriptive statistics analysis techniques to come up with the conclusions. The research findings revealed that students in the schools, preferred classroom activities regard to the effect of the curriculum. The teachers‟ personality and interrelationship with students was a crucial variable in attitude formation. The study further revealed that, the form or grade of the students were associated with liking mathematics.

The findings of this study may not be valid or reliable as the instrument used to collect data was not appropriate. The research instrument for a case study design is interviews schedule therefore the results of the study may be termed not meaningful. The research recommended students to be helped develop positive attitudes towards mathematics by both teachers and parents.

The quality of teachers is dependent on the selection of top-quality candidates for teaching, their pre-service education and continuous professional development (Kangethe & Nafuko, 2000). Maletsky (1988) presented this view that teachers must know their staff. They must know the pupils whom they are staffing. And above all they must know how to staff them critically. Teachers with proper qualification of the content develop self- confidence and serve a source of inspiration and a good role model to the students. This makes the student to like (have positive attitude to) the

subject. The study was interested in finding out teachers‟ levels of professional training and academic qualifications and how this influences attitude of the learners and how the teachers‟ professional skills impact on the learners‟ attitude and how this factor affects the resulting performance in mathematics

In pursuit for solution, Eshiwani (1993) found that factors which influence students‟ achievement in mathematics are directly related to the students‟ attitude towards these subjects. He reveals that factors include availability of teaching and learning resources such as mathematics models, libraries, textbooks, laboratories, laboratory equipment and chemicals. However, there is need to study how these factors are directly related to the students‟ attitude towards these subjects especially mathematics. This should be aimed at giving children a sense of reality in school, making schools into workshops, laboratories, libraries and inspiring educational experimentation.

In many instance attitudes are manifested by strong expressed feeling for or against mathematics and are linked with some emotion such as love, hate or fear. It is commonly felt that students‟ emotions, attitudes and beliefs are not only a result of past learning experience but that they will inevitably play a role also in the way he responds to new learning environments. Therefore, teachers and all who are involved in the education of children have a heavy responsibility in helping to create a favourable attitude towards mathematics. For teachers to achieve health and productive learning experiences they should seek ways to balance the strong cognitive demands that make student have sufficient affective reward.

1.2 Statement of the Problem

Pupils‟ performance in the mathematics subject has not been satisfactory both at the national level and stretches to the district and circuits levels of which Samreboi Circuit is of no exception, despite that Mathematics is one of the compulsory subjects taken in both primary and high school levels of education. Though the knowledge in mathematics is applied in all disciplines including everyday life. Unfortunately, it is evident from statistics that achievement in mathematics had remained low over the years.

More so, factors that can influence mathematics studying are demonstrated by Kupari and Nissinen (2013); Yang (2013); Tshabalala and Ncube (2016), when they showed that poor achievement in mathematics is a function of cross-factors related to students, teachers and schools. Among the students‟ factors, attitude is regarded by many researchers as a key contributor to higher or lower performance in mathematics (Mohamed & Waheed, 2011; Mata, Monteiro & Peixoto, 2012; Ngussa & Mbuti, 2017). Table 1 shows pupils‟ Basic Education Examination (BECE) mathematics achievement in 2018 and 2019 at the circuit level which comprises of eight (8) public schools and seven private schools.

Table 1: Samreboi Circuit BECE Mathematics Statistical Result for 2018 and 2019

	Year: 2018		Year: 2019	
School	**Number of students who sat for the exam**	**Those who passed**	**Number of students who sat for the exam**	**Those who passed**
A	92	58(63%)	89	70(78.7%)
B	25	17(68%)	30	17(56.7)
C	21	14(66.7%)	21	12(57%)
D	22	10(45.4%)	25	10(40%)
E	32	20(62.5%)	34	19(55.8%)
F	62	42(67.7%)	64	50(78%)
G	26	15(57.7%)	25	19(76%)
H	19	15(78.9%)	20	16(80%)
I	27	18(66%)	26	20(76.9%)
J	33	28(84.8%)	33	29(87.9%)
K	25	19(76%)	25	19(76%)
L	31	25(80.1%)	30	24(80%)
M	29	20(69%)	26	23(88%)
N	28	19(68.9%)	26	18(69%)
O	17	10(58.8%)	20	15(75%)

Source: Samreboi Circuit Education Office (2019)

The study of Eshiwani (1993) found that factors which influence students‟ achievement in mathematics are directly related to the students‟ attitude towards the subject. Sarmah and Puri (2014) referred to attitude as a learned tendency of a person

to respond positively or negatively towards an object, situation, concept or another person. Attitudes are not innate but are formed as a result of an individual‟s contact with the object and its environment (Supe, 2002). Attitudes can be both negative and positive as asserted by Chepcheing (2005) that early socialisation for instance tends to make children develop either of them. Attitudes can change and develop with time (Syyeda, 2016), and once a positive attitude is formed, it can improve students‟ learning (Akinsola & Olowojaiye, 2008; Mutai, 2011). On the other hand, a negative attitude hinders effective learning and consequently affects the learning outcome henceforth performance (Joseph, 2013).

Attitude is a fundamental factor that cannot be ignored. The effect of attitude on students‟ performance in mathematics might be positive or negative depending on the individual student. In response to this problem, this study seeks to examine the various factors that influence students‟ attitudes towards learning mathematics among junior high school students in Samreboi circuit. Meanwhile mathematics curriculum had been reviewed over time yet the performance seemed not to improve. This has remained a great concern to parents, teachers, the municipal directorate and other stakeholders who have called for a probe into mathematics achievement. Yankey, the Director of Education (DOE, 2016) claimed that the students‟ attitude towards mathematics and low performance in mathematics was attributed to teachers who lacked the subject competence and most of them are unskilled. Hence, his administration and other stakeholders introduced school performance assessment and monitoring and in-service training for teachers teaching skills and competency development. This was because of the urgent need to change students‟ attitude towards mathematics through well-developed teachers‟ competence to induce students‟ performance. All these interventions seemed to yield nothing as students

still perform below expectation (see Table 1) over the years as required by the directorate.

1.3 Purpose of the Study

The purpose of this study was to examine the factors influencing students‟ attitudes towards the learning of mathematics among the junior high school students in Samreboi circuit. The study was conducted by depending on such variables as parental factors, teacher influence and classroom instructions.

1.4 Objectives of the Study

Specifically, the study sought to:

i. Assess parental influences on students‟ attitudes towards the study of mathematics in Samreboi Circuit, Ghana.
ii. Identify how teachers influence students‟ attitude towards the study of mathematics in Samreboi Circuit, Ghana.
iii. Assess how classroom instructional activities influence students‟ attitude towards the study of mathematics in Samreboi Circuit, Ghana.
iv. Examine the gender difference in the attitude of students towards the study of mathematics.

1.5 Research Questions

The following questions were formulated to guide the study:

1. How does parental factors influence students‟ attitudes towards the study of mathematics in Samreboi Circuit, Ghana?
2. How do teacher factors influence students‟ attitude towards the study of mathematics in Samreboi Circuit, Ghana?

3. How do classroom instructional activities influence students‟ attitude towards the study of mathematics in Samreboi Circuit, Ghana?
4. Do male and female students differ in terms of their attitude towards the study of mathematics?

1.6 Significance of the Study

The finding of the study has both theoretical and practical implications on the future of mathematics as a subject in our schools. Theoretically, the study has highlighted the factors that influence the students‟ attitude in mathematics among junior high school students in Samreboi Circuit and this would assist education planners and curriculum developers to map out strategies by which performance can be improved.

The finding is also expected to contribute to the advancement of knowledge about the factors affecting performance of mathematics among secondary school students. Results from this study would also have practical significance because it would lead to the improvement of strategies aimed at improving the performance in mathematics by fostering students‟ attitude in mathematics. The study would be of immediate help to curriculum implementers in the formulation of strategies aimed at enhancing students‟ attitude in mathematics.

1.7 Delimitations of the Study

The research was carried out in Samreboi Circuit in Wassa Amenfi West Municipality. The study was limited to both public and private junior high schools in the circuit. Ten (10) schools were selected out of the fifteen (15) junior high schools in the circuit. The study targeted form one, two and three students in the respective schools. The study was also limited to mathematics. The study was also limited to

parents‟ contributions to their wards‟ attitude formation in learning mathematics, teachers‟ support in students‟ attitude formation through teaching and learning mathematics and classroom instructions that influence students „attitude formation in learning mathematics.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 Introduction

This chapter contains the theoretical framework of the study and also reviewed literature related to the study on attitudes towards learning mathematics among students. This steams from the views of other authors or experts relating to the topic under investigation. The review is presented under the following sub-headings:

1. Parental factors and wards‟ attitude towards mathematics
2. Teacher factor and learners‟ attitude towards mathematics
3. Classroom instructional activities and learners‟ attitudes to mathematics
4. Sex difference and attitude towards mathematics

2.1 Theoretical Framework for the Study

This section highlights the theoretical underpinning of the phenomenon under investigation and its relatedness to the study. This study is therefore underpinned by the theory Social Cognitive Theory (SCT) propounded by Albert Bandura (1977).

2.1.1 Social Cognitive Theory (SCT)

From a social learning perspective, human nature is characterised as a vast potentiality that can be fashioned by direct and vicarious experience into a variety of forms within biological limits (Bandura, 1977). For that reason, the attitude of students towards the study of mathematics can best be underpinned in the SCT. Human behaviour has often been explained in terms of one-sided determinism. In such modes of unidirectional causation, behaviour is depicted as being shaped and controlled either by environmental influences or by internal dispositions. Social cognitive theory therefore favours a model of causation involving triadic reciprocal

determinism. In this model of reciprocal causation, behaviour, cognition and other personal factors, and environmental influences all operate as interacting determinants (such as attitude) that influence each other directionally.

Muro and Jeffrey (2008) are of the view that the SCT is an essential component of sustainable natural resource management and the promotion of desirable behavioural change. This theory is based on the idea that we learn from our interactions with others in a social context mostly separately by observing the behaviours of others and developing similar behaviours. After observing the behaviour of others, people assimilate and imitate that behaviour, especially if their observational experiences are positive ones or include rewards related to the observed behaviour. This form of observation is referred to as imitation (Bandura 1977).

Imitation/modelling serves as the principal model of transmitting new forms of behaviour. Children‟s mathematics attitudes form as a result of environmental influences, especially those that occur in interactions with parents (Jacobs et al., 2005; Cao, Forgasz, & Bishop, 2006) and teachers (Gunderson et al., 2012). People regulate their behaviour based on their discernment of the relationships between situations, actions, and outcomes) where others was avoiding things that have been associated with aversive experiences, but like and look for things that have pleasant associations (Bandura, 1977). A study conducted by Yang (2015) shows that students form positive attitudes when presented with interesting teaching strategies. This could be associated with the SCT as students learn and form attitudes (negative or positive) from what they learn from their immediate environment and such attitudes are translated to how they study mathematics.

Notwithstanding, there is some amount of influence that the environmental factors like parents, the school environment, teachers as well as gender disposition has on how much attitudes are formed by these students in the line of mathematics education. From the perspective of the SCT, there is an imitation from the factors of influence on the attitudinal characteristics of the students towards mathematics. Another factor is that of teachers whose predispositions may be imitated by the students as to whether they ought to study the subject or not. Teachers who showcase positive attitudes have higher chances of positively influencing students to develop positive attitudes. From the aforementioned, the study is rooted in the SCT as basis for which students‟ behaviour/attitude towards mathematics is influenced hence, its adaptation for this study.

2.2 Parental Factors and Wards Attitude towards Mathematics

As far as schooling is concerned, by the time a child starts school as a first-year students, he/she will have interacted with his/her parents who to a large extent, influence his/her perception of learning specifically mathematics contents. Parental expectations, desires and pressure they exert at home on their wards have been attributed for attainment variations among the sexes (Orton, 1994). Some parents view mathematics as a male biased subject (Costell, 1991). This is especially when parents react and reinforce their children differently. When their children do something mathematical, daughters are told “you‟ve really tried”, meaning nothing much is expected from the female child. But to their sons, they are told “you can do far much better” (Costello, 1991). This means that male children are expected to do a lot more in mathematics. It appears that such comments said by parents consciously or without much thought are registered in the sub-conscience of a child and may influence how he/she perceives mathematics. Hence, formation of attitudes among

students may have been unconsciously registered (imitated) from parents. Ghanney (2007) advocates that positive parental attitude toward education, parental support and interest lead to improved academic achievements. Parents are expected to provide for the basic needs of their wards while the government ensures that school infrastructure, teaching and learning resources, among others, are made available to the school to enhance the implementation of the mathematics curriculum. The inability of teachers, parents and other stakeholders to function as expected of the curriculum hinders the teaching and learning process.

A study conducted by Arko and Kporyi (2018) revealed that dislike of mathematics found in students is associated with anxiety and fear originating from the character formed from the home. This anxiety and fear may elicit negative attitudes towards the subject among students and unfavourable perceptions and attitudes about mathematics are passed on to children. Parents in certain societies view mathematics teachers as sarcastic and impatient, didactic and scornful (Mac Nab & Cummine, 1986). These views are unconsciously picked by students and they come to mathematics classroom with an already distorted perception and attitudes towards learning of mathematics. Another study was conducted by Ying et al (1991) with a sample of 894 students from 26 schools in Hong Kong to identify correlations between mathematics achievement and expectations from parents and of students themselves. It was found that parental expectation and students‟ achievement in mathematics had a strong correlation while parental influences can be either direct or indirect. Direct influences include parents helping their children with mathematics difficulties and provision of needed resources while indirect parental influences include parental encouragement, parental expectation and their own attitude towards mathematics (Cai, Moyer, & Wang, 1997).

Another study conducted by Mahamood et al. (2012) regarding parental attitude and involvement in children‟s education specifically parental aspiration in Selangor, Malaysia revealed that parental involvement is a positive and powerful source of influence towards the achievement of adolescents in mathematics. The study further indicated that parental expectations influence attitudes formation amongst secondary school students was the contention of this study. There is therefore a link between parental as an influencing factor to the attitudes formed by students towards the study of mathematics.

2.3 Teacher Factors and Learners' Attitude towards Mathematics

The implementation of the mathematics curriculum cannot be attained without the supervisory duties of the school authorities. The headmasters monitor and guide curriculum implementation by ensuring that schemes of work and lesson plans are prepared regularly. Effective curriculum implementation does not take place in schools where the headmasters are incapable of executing supervisory functions (Geoffrey & Rodgers, 2000). Oluwole (2001) is of the view that parental discipline affects academic output of students‟ degree of self-efficacy. Students of tolerant parents are too complacent, unmotivated, and lack self-efficacy.

Irrespective of the competence of teachers in the implementation process, attitude as an individual‟s pattern of thinking, acting and behaving is significant (Voeten-Smith, 2004). It has very serious implications on the learner, the teacher, the immediate social group with which the individual learner relates, and the entire school system. Attitudes are formed as a result of some learning experiences students go through (Harbison & Hanushek, 1992). In this respect, learners draw from their teachers‟ disposition to form their own attitude, which may likely affect their learning

outcomes and therefore teachers with positive attitude toward mathematics are inclined to stimulate favourable attitudes in their pupils (Dzakadzie, 2015). Teachers‟ attitude and beliefs play very significant roles in shaping classroom practices (Voeten-Smith, 2004).

New curriculum implementation and syllabus re-arrangement become a challenge to teachers to acquaint themselves and this impacts negatively on how students learn mathematics while in class (Russell, 1983). Fishbein and Ajzen (1975) argue that whenever a new concept is introduced in the syllabus or taught for the first time in class, an attitude towards it is formed both by the students and the teachers. The teacher‟s attitudes reinforce the attitudes formed by the students towards learning of the new concept or the consequent similar concepts. Twoli (1986) in his work on sex-difference in science achievement found out that teachers‟ characteristics influence learning. A teacher‟s way of looking at issues generally and, mathematical concepts influence the learner. A student would like to learn a new concept depending on how the teacher presents it.

Flanders (1965) also found that students of teachers who vary their teaching style have positive attitudes and these teachers can teach a concept (in mathematics) better and learning is made easier. She added that it is paramount for such a teacher to have a mastery of content being taught. If this be the case students‟ attitudes towards learning of mathematics may be enhanced. Flanders adds that teachers who show acceptance, clarifications of students‟ feelings and praise have been associated with more positive attitudes towards a higher achievement by the students. Costello (1991) agrees that many teachers often unconsciously reinforce and validates students‟ perceptions of appropriate gender-related behaviour. He further asserts that boys are

assigned assertive roles and when they do well, they are told they have a talent. But girls may be assigned less assertive roles and when they do well in mathematics, they are reminded that they have at least worked hard to achieve such grades. Because of this unconscious reinforcement from teachers, boys and girls form different attitudes towards learning of mathematics.

Costello (1991) also found out that advice given to girls by teachers is too restricted in scope, usually too little and given too late when a female student is almost completing her secondary school education. Teacher‟s gender may determine how he/she portrays mathematics. Unconsciously male and female teachers form attitudes towards the subject they are teaching. These attitudes formed by teachers depending on their own gender influence how their students will learn the subject being taught, mathematics included. Fennema and Sherman (1976) assert that teachers are a major determinant in students‟ learning of mathematics and to a large extend determine what the students might achieve (Eshiwani, 1984). This is because of the teacher‟s inherent attributes; his/her qualification and training, his/her general behaviour and attitudes towards mathematics, other subjects and towards the students themselves.

Worth noting is that most female teachers prefer to teach language subjects and in arts subjects. But male teachers mostly prefer science and mathematics. This scenario is consciously registered in minds of the students and in the process, they unconsciously form attitudes towards learning in general and particularly learning mathematics (Oketch, 1982), (Mwangi, 1983), (Cockcroft, 1982) and (Onyango, 2003). Cockcroft (1982) noted aptly that there is no area in knowledge, where a teacher has more influence over the attitudes as well as the understanding of his/her

pupils than he/she does in mathematics. During his/her professional life, a teacher of mathematics may influence for good or bad the attitudes towards mathematics of several students and decisively affect many of their career choices.

Orton‟s (1987) works found out that teachers pay more attention to boys than girls while teaching mathematics because of their own prejudiced believe that boys achieve better than girls in mathematics. This could be so in a mixed class, but not in a single-sex class. Regardless of this misconception, girls achieve more in mathematics in single sex schools than in mixed schools while boys perform better in mixed schools than in single sex schools KNEC Report (2007).

However, teachers‟ support is also necessary tool to encourage positive attitudes towards mathematics (Marchis, 2011; Sakiz et al., 2012). Teachers‟ strong influence on students‟ beliefs in their mathematical competency suggest the importance of the teacher‟s role in mathematics classrooms which leads to improvement in students‟ mathematics performance (Berends, Goldring, Stein, & Cravens, 2012; Charalambous, Panaoura, & Philippou, 2009; Johnson, 2000). The affective dimensions of teacher support significantly affect students‟ academic, emotional, behavioural, and motivational outcomes in educational environment (Sakiz, 2007). Components in Teachers‟ Affective Support are specified as caring, respect, concern for, and interest in students, valuing, listening, fair treatment, encouragement, and high expectations (Sakiz, 2007).

According to Rodriguez-Brown (2009) one of the contributions that schools and teachers can make that supports children‟s transition from home to school is to invite parents to visit the classroom anytime during a present day. In Rodriguez-Brown (2009), teachers‟ activities were found to be unique but effective in conveying

to parents the teacher‟s acceptance for the knowledge the parents already have as well as their involvement in their child‟s instruction. The context of family and community are critical to a child‟s school learning but the school is not impotent in affecting the beliefs and behaviours of adults outside the school who influence the child‟s learning and development (Redding, 2010). The school and the families it serve can define their own community with its sense of purpose, patterns of relationship, and expectations of all its members according to their roles. Hence the type of class set up became this study‟s contention.

2.4 Classroom Instructional Activities and learners' attitudes to Mathematics

Mathematics teachers use different Discourse patterns in presentation of their work. Yavoz (1991) carried out a study to investigate the effects of different teaching instructions on immediate and retained attitude towards mathematics and the topic of mathematics achievement level of tenth grade students. The research was conducted on 120 tenth grade students and the topic selected was areas of polygonal regions. Quasi experiment design was employed and yet purposely sampling was used to select the 120 students. The study did not have a control group but gave treatment to all the sampled students. The data was analysed by analysis variance, two-way classification. The results of the study revealed that the interest (attitude) level of students taught by discovery method showed significant higher attitudes towards mathematics than the students taught by lecture method.

However, the study did not indicate how other extraneous variables like high achievement in the mathematics test scores of the students, private coaching was controlled hence, validity of the results is questionable. Traditional instructional practices that centre on teacher dominated pedagogy predominates our schools

(Changeiywo, 2001). Changeiywo observed that learning activities in most secondary schools‟ centre on the textbook and past question papers. Linder (20000) argues that students‟ perceptions of mathematics may be affected negatively by the way the subjects presented. The author observes that this applies to all other subjects.

Studies on teaching behaviour indicates that there are teaching instructions that influence students‟ attitude more positively than others. The author further argues that, teachers who made use of hands-on activities to illustrate concepts in science and mathematics, as indeed in other subjects as well, helped the students develop a liking in those subjects (Linder, 2000). In his study, Wachanga (2004) argues that instead of imparting information, the teacher should create situations where learners will ask questions, experiment and discover facts and relationships. Information transmission pedagogy stifles intellectual development because it weakens vigour and efficiency of thought.

Wachanga further observes that lack of curiosity and innovativeness evident in many spheres of human endeavour all around us may reflect the teaching instructions and dulled curiosity rather than nurturing it. Greater attention should be paid to improving classroom aspects of teaching quality (Wachanga, 2004). Kochlar (1992) reinforces this that teaching instructions should nurture an environment of students‟ creativity I learning. Students must learn how to use subject-matter concepts in the solution of relevant problems (Kochlar, 1992). The author argues that only through this would the learners perceive the applicability of what they taught in school to situations of experience and this has a direct influence on attitudes towards the content matter of the matter of the subject.

It could be realised that various classroom teaching instructions have effect on students‟ attitude which also leads to influence their achievement. This triggers the attempt to assess how the various classroom instructions influence students‟ attitude in learning mathematics.

2.5 Sex Difference and Attitude towards Mathematics

Math is often considered to be a domain in which boys are higher achievers, both in terms of attitudes and self-concept. Contrary to this, studies have shown that math school achievement and grades do not differ significantly between boys and girls (Scafidi & Bui, 2010). This similarity in performance between males and females is clear in the meta-analysis conducted by Lindberg, Hyde, Petersen and Linn (2010) with data from 242 studies representing 1.286.350 people, indicating no gender differences (r = 0.05) and nearly equal male and female variances. There are, however, noticeable differences in the beliefs held by boys and girls. Studies (Asante, 2012; Lindberg, et al., 2012) have consistently shown that girls have lower mathematics self-concept than boys. However, studies concerning gender differences in attitudes are less consistent than those in self-concept.

Some studies have reported significant differences when girls‟ and boys‟ attitudes towards mathematics are compare. Nevertheless, there are a number of studies where these differences are not identified (Eshun, 2014; Asante, 2012; Ma & Kishor, 2016). A meta-analysis conducted by Etsey and Snetzler (2016) taking into consideration 96 studies (n = 30490) concluded that gender differences in student attitudes toward mathematics do exist but are small. The results indicate that males show more positive attitude towards mathematics than females. Also, Hyde et al. (2010) in their meta-analysis confirm small gender effects, which increase among

older students (high school and college), with females holding more negative attitudes. Asante (2012) opined that, when compared with boys, "girls lacked confidence, had debilitating causal attribution patterns, perceived mathematics as a male domain, and were anxious about mathematics. The study of Asante showed that boys had more positive attitudes towards mathematics than girls.

2.6 Summary of Review of Literature

The literature reviewed focused on key variables in the research topic as well as the objectives of the study. These were theoretically and empirically reviewed to reflect the views of experts and researchers in the line of attitude as a motivating factor to the study of mathematics by students. In that regard, both local and foreign studies were reviewed. However, it ought to be said that most of the empirical literature reviewed were conducted outside the jurisdiction of Ghana especially in the Samreboi Circuit. The chapter shows that there exists an influence of parent characteristics on the attitudes formed by their wards towards mathematics. These attitudes would either be negative of positive as both appear to have a higher influence on the child as indicated by Bandura"s (1977) social cognitive theory. It has also been identified that the school environment including the disposition of teachers and students" own characteristics influence their attitudes towards the study of mathematics.

Studies has it that students who are positively influenced by their teachers possess positive learning attitudes towards mathematics while those who are negatively influenced dislike anything associated with mathematics. For instance, the study of Arko and Kporyi (2018) identified that the poor attitude of students towards mathematics is as a result of the attitude of teachers teaching the subject as some of

them are unable to explain concepts into simple terms to the understanding of students. However, there is a literature gap as most of these studies were not conducted in the Samreboi Circuit.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter presents the procedures that have been followed to carry out the study. It captures the research design, the population, sample and sampling procedure, the research instruments, data collection procedure as well as data analysis.

3.1 Research Design

The study adopted the cross-sectional survey research design rooted in the quantitative research approach. The choice of the research design was based on the notion of Tate (2016), that in the cross-sectional survey research design, data is collected at one point in time with an interest in describing the relationships among variables. This case, the current study sought to investigate the factors influencing students‟ attitudes towards the learning of mathematics. As indicated by Amedahe (2012), the design allows the collection of data which aided in testing hypotheses or to answer questions concerning current status of the phenomenon under study as indicated.

Again, Cohen, Manion and Morrison (2007) opined that generalising from a sample to a population helps to make inferences about characteristics, attitudes, and behaviours of the original population hence, the choice of the design for this study. Additionally, this paradigm allows some fraction of the population that is, the sample (students) through data collection process of asking questions as a sample used and the findings generalised to the entire population. The study employed the descriptive survey research design with quantitative approach in achieving the ultimate objectives of the study. The quantitative research approach involved the process of employing

objective measure to a numerical data with the view of demonstrating the relationships existing between variables (Cresswell, 2014). In a study like this, the approach is important because it helps to assess the extent to which the attitude of the students affect their study and performance in mathematics. The design also enabled the researcher to assume the quantitative approach as a characteristic of descriptive research involves the use of numerical analysis of research questions and seeking answers to them (Cresswell, 2014). Based on the aforementioned, the descriptive cross-sectional survey research design was adopted.

3.2 Population

The population for the study was 2,080 Junior High School students in the Samreboi circuit. This comprised both male and female students in the Samreboi Circuit. However, the accessible population was 1200; that is, second year students who are currently in school. Additionally, the form two students were considered for the study because they were the only group of students currently in school because of the Covid 19 pandemic break. The respondents have also been chosen for the study because they have at least a two years interaction with the teachers and their mates who may influence them to either develop a poor or good attitude towards the study of mathematics. In that regard, they were in the best position to give relevant information concerning the phenomenon under investigation. The category of the population ranges from age 15-22years as at the time of the study.

3.3 Sample and Sampling Procedures

The sample size for the study was 180. The sample comprised JHS 2 students in the Samreboi Circuit. The choice of the sample size was based on the recommendation of Cresswell (2014) that at least, 25-35% of the population can be

used for the study hence, the sample can be generalised to the entire population. On that note, the researcher settled on 180. Simple random sampling technique was used. Specifically, the lottery method was used to select the participants where pieces of paper with 1, 2, and 3 written on them, mixed in a basket and the respondents were asked to randomly pick in the class. This process was repeated until the sample (180) needed for the sample is achieved.

Furthermore, the respondents (students) who picked 1 or 3 were classified as the sample (respondents) based on the recommendation of Cresswell (2014). The choice of the simple random sampling allows fair representation of the population. In this case, every participant has equal chance of being selected to partake in the study. The use of the simple random sampling implied that no member of the population was denied the chance of representing the population in the study. The simple random sampling was necessary because it helped to randomly sample the respondents from the population that each student will stand a chance of being selected to represent the entire population (Jackson, 2009).

3.4 Data Collection Instrument

The study used structured questionnaire for the data collection. The questionnaire was made up of five (5) sections. Each section was based on any of the research objectives and on the four-point Likert scale of Strongly Disagree, Disagree, Agree and Strongly Agree except the demographic background information of the respondents. Section A of the questionnaire had two items consisting of the sex and age of the respondents. Section B had six items focusing on parental factors that influence students‟ attitudes towards the study of mathematics. Section C had eight items focusing on how teachers influence students‟ attitude towards the study of

Mathematics while Section D had eight items focusing on classroom instructional activities that include students" attitude towards the study of Mathematics.

3.5 Pre-Testing of the Questionnaire

The pre-testing was meant to ascertain whether the items are presented in clear and understandable language and verify whether the participants in the piloting interpreted the questionnaire items similarly. Based on this, it was necessary to pre-testing the instrument. Pre-testing of the instrument was carried out in the Samreboi circuit among students who were not part of the original data collection. The pre-testing was done since it helped in achieving reliability as it resulted in correcting and appropriately adjusting areas of weakness in relation to the topic under study.

3.6 Validity and Reliability of the Instrument

The questionnaire was taken through face, content and constructs validity procedures. Assessment of the content and construct validity was achieved using non-statistical approaches including peer and expert reviews as propounded by Cohen et al (2007). First, face validity of the instruments was ascertained by effecting the comments of my supervisor who is an expert in the field of education. The initial instrument was given to a measurement and evaluation expert to check the structure, layout and conformity to the research objectives and questions or hypothesis and item construction procedures.

Also, the views, comments, additions and deletions that were raised as a result of the pre-testing was affected. Content validity on the other hand was ensured with the assistance from my supervisor who is well grounded in education. The supervisor assessed the instrument in relation to the research objectives in determination of how well an item measures what it is intended to measure (validity). The pre-testing helped

to determine how consistent the results of this study was when used in another setting under similar test conditions (Cohen et al., 2007). An estimated reliability coefficient of 0.81 was proposed for the questionnaire by my supervisor after the pretesting. This means that the instrument is reliable since Pallant (2010) opined that an instrument is reliable when it" Cronbach"s alpha coefficient is above than 0.7.

3.7 Data Collection Procedures

Since the study involves human beings, the ethical principle was adhered to during the data collection. The researcher obtained an introductory letter from the Head of Department, Educational Foundations, University of Education, Winneba and presented copies of the introductory letter given to the school authorities and then for the main data collection. The researcher personally visited the school to familiarise himself with the school authorities and inform them about the purpose of the study and their expected role during the data collection. The purpose of this introductory letter was to solicit for cooperation and to create the needed rapport with the students and the school authorities.

Confidentiality of the respondents was maintained as required and the respondents were made aware of the fact that their participation was voluntary since they are free to decline at any time during the study. The questionnaires were then distributed to the students after which the researcher ensured independency as they responded to the questionnaire. Each respondent spent within 10-20 minutes on the questionnaire and 15 working days to administer all questionnaire in all the 15 schools. The researcher self-administered the questionnaire to the respondents in their respective classes. After the respondents responded to the questionnaire, they were personally collected back by the researcher and kept in a safe.

3.8 Data Analysis

Data were analysed descriptively using frequency and percentage counts for the demographic information of the respondents. Research questions 1, 2 and 3 were analysed using means and standard deviations. Research question four was analysed using independent samples t-test.

3.9 Ethical Considerations

Issues with confidentiality and privacy of personal rights of the respondents were protected. Permission was obtained from relevant authorities. The objective of the study was explained verbally and respondents were assured that their participation was voluntary and information obtained would be kept confidential. Brink (2006) defined confidentiality as the researcher‟s responsibility to protect all data gathered within the scope of the project, from being made available to any other person. The respondents were also directed not to write their names on the questionnaires. They were assured that neither their names nor location would appear on the research report to reveal any identity. The respondents were again informed that their participation in the research was voluntary and that they can withdraw even after consenting to cooperate in the research.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION OF FINDINGS

4.0 Introduction

This chapter presents the analysis and discussion of the result. The analysis was structured into two parts. The first part focused on the demographic information of the respondents whereas the second part focused on the main analysis based on the research questions. Descriptive statistics (frequency and simple percentages, mean and standard deviation) and inferential statistics (independent sample t-test) were used to analyse the data.

4.1 Background Information

The background information of the respondents was determined with the first and second items on the questionnaire on sex and age. Frequency counts and simple percentage was used to analyse the data as presented in Table 1.

Table 1: Background distribution of the respondents

Variable	Sub-scale	Frequency	Percentage (%)
Sex	Male	100	55.6
	Female	80	44.4
Total		**180**	**100**
Age	Below 15	66	36.7
	15-18	113	62.8
	19 and above	1	.5
Total		**180**	**100**

Source: Field Survey, 2021.

The result in Table 1 shows that most (55.6) of the respondents who participated in the study were male students. This is followed by the females (80) with

a percentage of 44.4%. The difference in the frequency could be associated with the male dominance in the school. Additionally, out of the 180 respondents, 113 (62.8%) of them were between the ages of 15-18 followed by 66 (36.7%) who were below 15 years. More so, 1 respondent (0.5%) out of the 180 was older than 18 years at the time of the study.

4.2 Analysis of Research Questions

The results were obtained from the questionnaire administered to the students concerning their attitudes towards the study of mathematics. A mean of 2.50 was used to determine the positive and negative responses. This means that, responses lesser then 2.50 were classified as negative (disagree) while those equal or higher than 2.50 were classified as favourable/positive (agree) responses. The results are presented in frequency distribution tables.

Research Question One

How do parental factors influence students' attitudes towards the study of mathematics?

Mean and standard deviation were used to analyse research question one which sought to ascertain the parent factors that affect students‟ attitude towards Mathematic. Item 2-8 on the questionnaire was used to answer the research question.

Table 2: Parental factors that influence students' attitude

Variable	Mean	Std.
My parents think mathematics doesn"t have any connection with the real life.	1.34	.65
No matter how much time I spend studying mathematics, I can"t get better marks because my parents don"t like to help me.	1.85	.94
No matter how much time I spend studying mathematics, I can"t get better marks because I have no one to help me at home.	2.17	.95
If I practiced more, I would have better results but I don"t get any sufficient support at home nor from my parents.	2.38	1.15
My family tells me that Mathematics is one of the most interesting school subjects to study.	3.32	.95
According to my parents, the topics covered in mathematics lessons are not interesting.	1.67	.93
Average Mean/Standard Deviation	**1.12**	**0.93**

Source: Field Survey, 2021.

Reference to Table 2, it can be seen that the respondents disagreed that their parents or home related factors influences their attitudes about the study of mathematics. In order words, the respondents were against the notion that parent/family related factors influenced their attitudes towards the study of mathematics. This is evident in the mean score of 1.12 and a std. of 0.63. The standard deviation therefore means that as it is less, the likelihood that the scores were close to the item mean. in order words, there was less versatility in the scores hence, most of the respondents disagreed to the assertion that parental factors such as their perception toward mathematics and the amount of time and money they spent on their children.

Table 2 shows that apart from the family of the respondents who tells them about the interest or relevance of mathematics, all other they disagreed with all other

items. For instance, where a mean of 3.32 and std. of 0.95 was recorded for a positive family influence on the attitude of the students towards the study of Mathematics, a mean of 1.34 and std. of .65 was recorded on the item that states that „My parents think mathematics doesn‟t have any connection with the real life‟. This clearly mean that the students disagreed to the item because the mean is lesser than the standard/set mean of 2.50 as used in this study. The result in Table 2 also revealed that a mean of 1.80 and std. of .94 was recorded on the item that sought to seek the views of the respondents concerning the perception or knowledge of the students about the study of mathematics. Specifically, they were against the statement that „No matter how much time I spend studying mathematics, I can‟t get better marks because my parents don‟t like to help me.‟ Clearly put, there was less agreement among the response since the std. is relatively lesser compared to the item mean.

On the item of the student‟ attitude about practicing what they learnt over a period of time, it emerged that about half of them disagreed to the statement that, „If I practiced more, I would have better results but I don‟t get any sufficient support at home nor from my parents‟. This was evident in the mean of 2.38 and a standard deviation of 1.15. This means that the respondents did not believe that they when they practice more what they have already studied, they will get better understanding. Hence, they disagreed that they get enough support systems from their parents and family concerning the study of mathematics both at home and school.

Also, the analysis as presented in Table 2 shows that a mean of about 1.67 and a standard deviation of 0.93 of the respondents disagreed that their parents hold the perception that topics covered in their mathematics lessons are not interesting. To them, they have interesting topics in mathematics however, the extent to which such

topics influence their attitude towards their studies is lacking. The respondents therefore agreed that mathematics have interesting topics wealth studying hence a mean of 3.32 and a standard deviation of .95 was recorded (refer to Table 2). However, the result as presented in Table 2 shows that the respondents disagreed that their parents influenced them to develop poor attitudes towards the study of mathematics. This is evident in the average mean score of 1.12 and a standard deviation of 0.93.

The result therefore disagrees with existing literature. For instance, the quantitative study conducted by Arko and Kporyi (2018) among SHS students concluded that the students‟ dislike for mathematics learning has its influence from factors emanating from their parents and the home or society at large. Arko and Kporyi further stated that anxiety and fear originating from the character formed from the home accounts for the poor attitude of students towards mathematics studying. Similarly, Mac Nab and Cummine (1986) studies the perceptions and home factors that affect the attitude of students towards mathematics. Mac Nab and Cummine therefore found that parents view mathematics teachers as sarcastic and impatient, didactic and scornful hence, they do not encourage their children to study the subject.

The study of Mahamood et al. (2012) also disagreed with the current result in the sense that parental expectations influence attitudes formation amongst secondary school students was the contention of this study. More so, the extent of the influence of the parental factors on the attitude of the students have not been duly established. On the part of Mahamood et al., family, home or parental factors account greatly to the formation of attitudes among students. They associated the change and formation of attitudes to the family orientation and background of the students. Mahamood et al.

further established that home factors affect students‟ progress in mathematics than any other factor.

Research question two

How do teacher factors influence students' attitude towards the study of mathematics?

In order to answer research question two which sought to investigate the teacher factors that influence the attitude of students towards the study of mathematics, items 9-16 on the questionnaire were used to solicit relevant information to that effect. The result is presented in Table 3.

Table 3: Teacher factors that influence students' attitude

Variable	Mean	Std.
My teacher explains mathematics willingly to us.	3.48	.73
My teacher encourages me, when I have difficulties with mathematics.	3.33	.80
My teacher encourages me, when we have difficulties with our mathematics assignments.	3.62	.73
My mathematics teacher is one of my favourite teachers.	3.62	.73
My teacher is a good mathematician.	1.99	1.09
My teacher is a good at teaching us mathematics problems.	3.23	.95
Teachers have negative perception about our ability to study mathematics.	3.23	.77
Out teachers have lower perceptions of the girls‟ abilities than boys.	3.23	.77
Average mean/Standard Deviation	3.23	0.82

Source: Field Survey, 2021.

The result presented in Table 3 revealed that the respondents agreed that their teachers influenced their attitudes towards the study of mathematics. Specifically, this can be seen in the average mean of 3.23 and a standard deviation of 0.82. this means

that the respondents agreed because the average mean is higher than the standard mean of 2.50 as set on the questionnaire and the analysis. Furthermore, the study found out that out of the total of respondents who took part in the study, a mean 3.48 and a standard deviation of .73 agreed that their teachers explain mathematics concepts to them willingly. In respect to Table 3, the responses also revealed that the respondents agreed to the item which states that, „My teacher encourages me, if I have difficulties with mathematics". This presupposes that most of them positively responded to the item hence a mean of 3.33 was recorded against the standard mean (2.50).

Also, it emerged that the respondents agreed that they have positive attitudes towards the study of mathematics because their teachers encouraged them whenever they face challenges in their guest to solve mathematical problems. This has attracted a mean of 3.62 and a standard deviation of .73. More specifically, the data analysed also revealed that the respondents were positive in their response to their likeness for their teachers based on their own perception of favourite. As such, they claim that their mathematics teachers are their favourites in the school with a mean of 3.62 and standard deviation of .43.

Similarly, a mean of 3.23 and a standard deviation of .95 as revealed in Table 3 shows that the respondents agreed that their teachers are good mathematicians. To them, irrespective of the competence of challenges their teachers face, they see them as the best due to the kinds of supports given them during classes hours and after classes hours. Hence, an item means of 3.23 higher than the standard mean of 2.50. It was also discovered during the analysis that the respondents agreed that their teacher hold negative perceptions about the ability of students to study mathematics with a

mean of 3.23 and a standard deviation of .77. also, the respondents agreed that their teachers have lower perceptions of the ability of females to perform better on mathematics concepts or equations than their male colleagues. This statement also attracted a mean of 3.23 and a standard deviation of .77.

However, the respondents further indicated that they do not see their mathematics teachers as „bad" among all other teachers. Specifically, less than half of them indicated that their mathematics teachers are not good hence, they hold the perception that they have one of the fun-tuned mathematics teachers in their school (M=1.99, SD=1.09). From the analysis presented in Table 3, it can be observed that the students agreed that their mathematics teachers explain mathematical concepts to them willingly while encouraging them to overcome their difficulties hence, they are their favourite teachers.

The result is in congruence with available studies in the area of mathematics, attitude formation and perception about the study of mathematics. For instance, Dzakadzie (2015) opined that student must often than not, draw from their teachers" professional qualities to form their own attitude. Dzakadzie further indicated that the attitudes formed by the students as the learn from their teachers" behaviours towards the subject affect their learning outcomes. This means that teachers with positive attitude such as encouraging their students and helping them to solve mathematical problems stimulate positive attitudes in the students to study the subject.

In another perspective, the current study is in line with the finding of Voeten-Smith (2004) who claimed that teachers" attitude and beliefs play very significant roles in shaping classroom practices of their students and themselves. Hence, there is higher propensity that mathematics teachers who voluntarily support their students to

solve mathematical problems encourages their students to study positively. Additionally, the finding of Berends et al. (2014) confirms the result of the current study. Berends et al. were of the view that the teachers‟ strong influence on the beliefs of the students in their mathematical competency suggest the importance of the teacher‟s role in mathematics classrooms. Berends et al. therefore concluded that positive attitudes of teachers lead to improvement in students‟ mathematics performance.

Irrespective of the attitudes of the students towards learning mathematics, the study found that teacher related factors account for the formation of such attitudes that makes teaching and learning effective. Unlike other studies, the current study revealed a positive influence that teacher classroom activities or characteristics have on the way students‟ study and perform on mathematics problems.

Research question 3

How do classroom instructional activities influence students' attitude towards the study of mathematics?

The third research question examined the classroom instructional factors that affect the attitudes of the students about the study of mathematics and the 17th to the 23rd items on the questionnaire were used to collect data to that effect.

Table 4: Classroom instructional factors that influence students' attitude

Variable	Mean	Std.
We find it easy to ask our teacher when we don"t understand something at mathematics classes, I ask my teachers immediately.	2.43	1.18
When I don"t understand something at mathematics classes, I ask one of my colleagues in the break after the class with ease.	1.95	1.06
Avenues are made possible in class for students who can"t solve their homework,	2.68	1.13
A student"s natural predispositions for mathematics	1.53	.85
Insufficient teaching aids/resources for use by teachers and students.	1.84	1.11
Teachers are not well preparations before entering the class.	1.67	.91
There is no/little cooperation between teachers and students in the mathematics class.	1.90	.99
The student"s involvement in extra-curricular activities in school.	1.99	1.09
Average Mean/Standard Deviation	1.99	0.82

Source: Field Survey, 2021.

Mean and standard deviation was used to analyse the data. As far as this study is concerned, it was identified that the respondents disagreed to the influence classroom activities, conditions or instructional related factors affect their attitudes towards the study of mathematics. From Table 4, the analysis shows that an average mean of 1.99 and a standard deviation of 0.82 was recorded on the items that assessed the classroom instructional antistites that influence the attitude of the students towards the study of mathematics. For instance, they augured that they do not find it easy asking their teachers when they do not understand something (concepts) in mathematics classes. They were of the view that they are unable to seek guidance from their teachers whenever they find difficult tasks in mathematics. Hence a mean of 2.43 which is lesser than the standard mean and a standard deviation of 1.88.

On the item of consulting their colleagues on mathematical issues that they do not understand, the respondents disagreed that they consult their friends as can be seen in the item mean of 1.95 and a standard deviation of 1.06. The mean is qualified as unsatisfactory because the item mean is lesser than the standard mean. Again, the result in Table 4 shows that the respondents disagreed that their personal dispositions for mathematics influences their attitudes towards the study of the subject. This is evident in the mean score of 1.53 and a standard deviation of .85 compared to the average mean score of 1.99. this clearly shows that they disagreed to the item because the item mean is far lower than the average mean.

With regards to the availability of teaching and learning resources as used by the teachers and students, the responses suggest that the respondents were negative since the item mean of 1.84 is lower than the standard mean. From the analysis, this result shows that the respondents disagreed to the statement. To further clarified the response of the students, it emerged that about 1.67 (mean), .91 (standard deviation) of them disagreed that their teachers prepare well before the commencement of their mathematics lessons. This response suggest that the teachers appropriately prepare to class hence it does not negatively influence the poor attitudes of the students towards the study of mathematics. Similarly, the responses shows that there is much cooperation between the teachers and their students concerning their attitudes towards mathematics. Hence, a mean of 1.90 and standard deviation of .99 was recorded on the negative statement that states that „There is no/little cooperation between teachers and students in the mathematics class". Clearly put, the exist positive cooperation between the students and their mathematics teachers hence there is the likelihood that such positive gestures will influence them positively to study mathematics.

However, the students disagreed that they involve themselves in extra-curricular activities in their schools. Particularly, the result in Table 4 shows that a mean of 1.99 and a standard deviation of 1.09 of the respondents disagreed to the statement. Therefore, there is high involvement of the students in extracurricular activities that influences them positively to study mathematics in the senior high schools. As far as the availability of opportunities in classes for students to explore is concerned, the study shows that a mean of 2.68 which is higher than the standard mean was recorded. This simply means that aside all other forms of classroom-based factors that influence the attitude of the students about the study of mathematics, the students are involved in every productive mathematics teaching and learning activity.

The result on the influence classroom conditions has on the attitudes of students towards the study of mathematics revealed that the students disagreed to the statements. As such, the result disagrees with the study of Wachanga (2004) in the sense that the interest (attitude) level of students taught by discovery method showed significant higher attitudes towards mathematics than the students taught by lecture method. In simple terms, classroom conditions such as choice of instructional method have been identified as influencing the attitudes of students towards the study of mathematics.

Furthermore, Kochlar (1992) also disagreed with the current study in the sense that classroom instructional proceedings dictate to the students concerning his/her level of creativity. The study of Kochlar (1992) therefore shows that in and around the school, students hold the obligation of identifying and solving mathematical problems when they have positively developed their attitudes. However, such attitudes are only function when the student perceives the applicability of what is being thought hence,

they get assisted by their teachers and other friends in the cause of teaching and learning.

Research question 4

Do male and female students differ in terms of their attitude towards the study of mathematics?

In order to find out the difference between male and female students concerning their attitudes towards the study of mathematics, the demographic information of the respondents (gender) was used to solicit relevant information. Independent sample t-test, was used to analyse the research question. The result is presented in Table 5.

Table 5: Differences in the attitudes of male and female students

Variable	N	Male students		Female students		df	t-value	p-value
		Mean	SD	Mean	SD			
Attitude towards mathematics	99	53.37	6.68	52.62	5.51	178	.802	.414

Source: Field Survey, 2021.

An independent-sample t-test was conducted to compare the difference between male and female students in terms of their attitudes towards the study of mathematics. There was no statistically significant difference in the score for male teachers since more than half (M=53.37, SD=6.68) and female teachers (M=52.62, SD=52.62; $t(42)$= .802, p=.414 2-tailed) about the attitude of the students towards the study of mathematics. Therefore, male and female students do not differ in terms of their attitudes towards the study of mathematics (p=.414). Hence, the result shows that irrespective of the gender of the student, attitude for the study of mathematics

remains the same. The result agrees with the study of Scafidi and Bui (2010) who revealed that there is no difference among male and female grade students‟ achievement on mathematics. The study of Scafidi and Bui further revealed that both sexes perform similarly on their mathematics assessments hence, there is no difference what so ever.

However, there is incongruence between the current result and that of Hyde et al. (2010) that female and male students‟ difference in their perception and attitudes towards mathematics. Hyde et al. in their study concluded that males show more positive attitude towards mathematics than females. However, Hyde et al. (2010) also revealed that there is some amount of gender difference, which increase among older students (high school and college), with females holding more negative attitudes. In the case of Etsey and Snetzler (2016), although gender difference was identified as existing among students, its quantum was relatively small in their case study that investigated 96 students in the Elmina circuit, central region.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Overview

This section focused on the summary of the study, major findings, conclusions, recommendations and suggestions for further studies.

5.1 Summary of the Study

The study examined the factors (parental, teacher influence, classroom instructions) influencing students‟ attitudes towards the study of mathematics in JHS students in Samreboi Circuit. Literature was reviewed in accordance with the objectives and key variables in the study. The descriptive cross-sectional survey research design through the quantitative research approach was adopted for the study. The simple random sampling technique was used to select 180 students from the accessible population of 1200. A structured questionnaire (4-point Likert scale) was used to collect data and was analysed descriptively and through inferential statistics. The demographic data was analysed with frequency counts and simple percentages while mean and standard deviation was used to analyse research question 1 2, and 3. Again, independent sample t-test was used to analyse research question 4.

5.2 Major Findings

In accordance with the results presented in chapter four, the major findings are presented on the research objectives.

Research question one investigated parental influences on students‟ attitudes towards the study of mathematics revealed that JHS students in the Samreboi Circuit in the Wassa Amenfi West Municipality disagreed that their parents influence them to develop poor attitudes towards the study of mathematics.

The second research question also investigated the influence teachers‟ instructional characteristics have on the attitude of students towards the study of mathematics. The analysis of the result revealed that the students agreed that their mathematics teachers explain mathematical concepts to them willingly while encouraging them to overcome their difficulties hence, they are their favourite teachers.

Furthermore, research question three assessed the influence instructional activities have on the attitudes of JHS students in the Wassa Amenfi West Municipality towards the study of mathematics. The responses of the students revealed that classroom activities, conditions or instructional related factors do not affect their attitudes towards the study of mathematics.

Additionally, the fourth research question which examined the differences between male and female students about their attitudes towards the study of mathematics shown that gender do not influence their attitudes. In order words, there is no statistically significant gender difference in the attitude of male and females towards the study of mathematics.

5.3 Conclusions

Conclusions can be derived from the entire study based on the study's findings. The parental factors as influence for the attitudes of the JHS students towards the study of mathematics as studied. Most of the students agreed that their family members or parents tell them that mathematics is not a good subject to study. It was also identified that the students were away of their attitudes that it negatively affects their study and subsequently influence their performance. The views of the students are in line with the study of Mahamood et al. (2012) who opined those

parental expectations do not necessarily influence attitude formation of high school students.

Again, with reference to how teacher factors influence the attitudes of students towards mathematics, the researcher found that the respondents agreed that for instance, their teachers encourage them to study while they were also of the view that their mathematics teachers are their favourites. It was also indicated that the teachers hold positive perceptions about the students‟ ability to study mathematics. This supports the claim of Redding (2010) that although the family and community are critical to the students‟ learning, the school is not impotent in affecting the beliefs and behaviours of adults outside the school who influence the child‟s learning and development. Therefore, school factors relatively account to the attitude of students.

In terms of how classroom activities or conditions of the teaching and learning environment influence the students‟ attitudes towards the study of mathematics, it was discovered that classroom instructional factors do not influence the students to develop positive attitudes towards the study of mathematics. However, the students agreed aside the teachers making giving the students the avenue to study mathematics, all other items on the questionnaire recorded negative responses. The finding is supported by Wachanga (2004) whop stressed that instead of imparting information, teachers create circumstances where learners ask questions, experiment and discover facts and relationships. Wachanga further stated that the classroom conditions where teachers positively influence students‟ learning abilities makes the students more intellectually developed. From the perspective of the finding and available literature, the researcher concludes that the inability of instructional activities or conditions to influence the attitudes of the students will affect their progression in the study of

mathematics. Also, the study concludes that teachers who do not make the teaching and learning environment learner friendly makes interaction difficult thereby students do not form positive problem-solving attitudes as usually required of in mathematics.

Concerning the gender differences in the attitudes of the students towards the study of mathematics, it was found that both male and female students do no differ in their attitudes towards the subject. This claim was rejected by many studies (e.g., Hyde et al., 2010; Asante, 2012) who both found a statistically significant gender difference in the attitudes of students in terms of the study of mathematics. For instance, Asante (2012) found that male students have positive perception and behaviour for mathematics than female students. likewise, Hyde et al. (2010) found a positive significance in the performance of male students in mathematics than female students. It is concluded based on the finding and available literature that since gender do not play a significant role in the attitude formation of students towards mathematics, both sexes have a role to play in maximising their efforts in the subject.

5.4 Recommendations

In accordance with the findings and conclusions drawn in this study, the following recommendations were arrived at:

Regarding the first objective, which looked at the parental factors that influence students‟ attitudes towards the study of mathematics, it is recommended that the education directorate should organise a sensitisation workshop for parents/guardians to extensively educate them on the influence their actions and inactions has on the academic performance of their children as far as their attitudes to mathematics study is concerned. The study also recommends that school guidance and counselling coordinators should adopt strategies that will sensitise the entire PTA on

measures that they can put in place to influence their children positively to study mathematics.

Regarding the second objective that investigated the way teachers‟ instructional characteristics have on the attitude of students towards the study of mathematics and recommends that the GES, PTA and SMC should ensure that every teacher is provided with necessary teaching and learning resources that will enable them to teach mathematics using modern methodology or skills. Again, the GES and the Ministry of Education, Ghana should motivate all mathematics teachers to be up to the task of teaching the 21st century student using appropriate technology and skills. It is believed that such attempts will boost the will of the teachers to support and encourage the students to study mathematics.

On the basis of the third objective which examined the influence classroom instructional activities have on the attitudes of JHS students towards mathematics recommends that GES through the National Council for Curriculum and Assessment should sensitise all mathematics teachers on the negative effects that instructional conditions/activities have on the mathematical development of their students. the study also recommends that students themselves should be proactive in developing positive perception about the subject so that with the blend of the effort of their teachers, teaching and learning mathematics will be easier both for them and their teachers.

Based on the fourth objective which examined the gender difference concerning students‟ attitudes towards mathematics, the researcher recommends that parents, teachers and all other educational stakeholders should constantly encourage students (both male and females) to tune their minds to study mathematics. In so

doing, it is expected that teaching and learning as well as the performance of students academically will be developed. The study further recommends that parents/guardians should try as much as possible to assist their children at home to solve mathematical problems when necessary.

5.5 Suggestions for Further study

The following suggestions are made for further research:

1. The researcher suggests that future researchers should extend their studies beyond the boundary of Samreboi Circuit in Wassa Amenfi West Municipality. If possible, the entire region should be involved in the study.
2. It is further suggested that future studies should adopt the mixed method research approach so that both qualitative and quantitative data could be collected and analyzed for a more robust findings to be achieved.

REFERENCES

Aiken, I. D. (1996). *A study of teachers and students' perceptions of social studies and teaching method in social studies in selected junior secondary schools in Northern States in Nigeria.* Unpublished M. Ed. thesis.

Ajzen, G. & Fishbein, M. (1980). *Gender difference in mathematics achievement at the second cycle primary schools in south west Shoa Zone*. Unpublished M. Ed, thesis. Addis Ababa University.

Akinsola, B. & Olowojaiye, O. (2008). Personal and family paths to pupil achievement. *Social Behaviour and Personality, 34* (8), 907922

Amazingo, R. N. (2002). *Educational leadership and administration: Concepts, methodologies, tools and applications*. Information Resources Management Association, USA.

Amedahe, F. K. (2012). *Lecture notes on educational research*. University of Cape Coast, Cape Coast. (Unpublished notes).

Arko, A. D., & Kporyi, E. (2018). Attitude of students toward the study of Mathematics in Odoben Senior High School, Ghana: Implications for Curriculum Implementation. *Journal of Education and Practice, 9*(35), 2222-288.

Asante, K. (2012). Secondary students" attitudes towards mathematics," *IFE Psychological, 20*(1), 121–133.

Berends, M. Goldring, K., Stein, U., & Cravens, H. (2012). *Longitudinal study of attitudes toward mathematics in 5th through 12th Grades: Age and sex differences.* School of Education. University of Michigan.

Bolaji, K. (2000). Sex-differences in attitude of students towards Mathematics in secondary schools, *Mathematics Connection, 4*(3), 1–13.

Cai, J., Moyer, T., & Wang, S. K. (1997). *Curriculum in a new key: The collected works of Ted. T. Aoki. Mahwah, NJ: Lawrence Erlbaum Associates. Chief Examiners' Report, WASSCE (1998).* The West African Examinations Council, Accra: WAEC.

Cao, M., Forgasz, W., & Bishop, A. (2006). (2006). *Social interaction in mathematics class room: A case study of city secondary school.* Unpublished M.Ed. thesis. Addis Ababa University.

Changeiywo, A. J. (2001). *Applying communication theory for professional life: A practical introduction.* Thousand Oaks, California: SAGE.

Charalambous, M. Panaoura, K. & Philippou, H. (2009). Indiscipline in Nigerian Schools. *Journal of Counselling Association 3*(1): 11-19.

Chepcheing, M. J. (2005). Making a Connection between Student Achievement, Teacher Accountability, and Quality Classroom Instruction. *The Qualitative Report, 13*(4):560- 580.

Cockcroft, C. (1982). *The practice of social research* (11th edition). Cape Town: Oxford University.

Cohen, C., Manion, L., & Morrison, K. (2007). *Research methods in education (5th ed.).* London: Routledge Falmer.

Costell, D. (1991). Making audit acceptable: A collegial approach to quality assurance in quality management in higher education institutions. *Higher Education Quarterly*, 46(1):47-66.

Costello, K. (1991). Coercion Theory, Self-Control, and Social Information Processing: Understanding Potential Mediators for How Parents Influence Deviant Behaviour. *Educational Leadership, 60*(5), 6-11.

Creswell, J. W. (2014). *Research design: Quantitative, qualitative and mixed methods approach (2nd ed).* London: Sage Publications.

Davies, A. H. & Hersh, D. (2012). *The psychology of attitudes*. Orlando: Harcourt Brace Jovanovich College Publishers.

Dzakadzie, Y. (2015). *Rudiments of educational measurement, and statistics in education.* Kumasi, Benjoy Enterprise.

Eshiwani, S. (1993). Factors associated with types of mathematics anxiety in college students. *Journal for Research in Mathematics Education, 26*(4), 327-345.

Eshun, S. (2007). *Do private senior high schools perform better than public schools in Ghana*. Unpublished paper. Department of Educational Foundations, University of Cape Coast, Cape Coast.

Eshun, S. (2014). The effect of attitudes on performance on mathematics. *British Journal of Psychology, 17(*1), 127-140.

Etsey Y. & Snetzler, S. (2016). *A Meta-analysis of gender differences in student attitudes toward mathematics, in Proceedings of the Annual Meeting of the American Educational Research.* New York, Willie and Sons.

Fairclough, Y. (1993). *Factors that affect student's motivation to learn spoken English in grades 9 and 10 in some selected secondary schools in East Shoa zone.* Unpublished master"s thesis. Addis Ababa University.

Fennema, K. A. & Sherman, F. (1976). Analysing the perceived effectiveness of Academic leadership in Schools. *International Journal of learning and Development, 4*(1), 71-84.

Fishbein, R., & Ajzen (1975). *Analysis of the value education components of the secondary school's social studies programme.* The Nigeria Academy of Education.

Fishbein, S. A. (1975). *The process of learning*. New York: McGraw-Hill.

Fisher, E., & Rickards, P. (1998). *Introduction to Research in Education* (4th ed.). Holt: Rine hart & Winston Inc.

Flanders, S. (1965). Approaches to the enhancement of tertiary teaching*: Higher Education*, *Research and Development*, *8*(3), 7-25.

Fraser, L. & Kahle, G. (2008). *New forms of classroom assessment: Implications for staff development.* New York: Macmillan.

Geoffrey, D & Rodgers, T. K. (2000). Teacher receptivity to system wide change in the implementation stage. *Review of Educational Research. 57*(3), pp. 237-254.

Ghanney, R. A. (2007). Effects of home environment on parental attitudes toward the educational attainment of senior high school pupils in Winneba, Ghana. *International Journal of Educational Research, 3* (2), 259- 266.

Goldin, L. (2000). How effective are various approaches to improving student achievement? *Higher Education Research and Development*, *6*(5),34-52.

Gregersen, Q. (2018). *The multicultural classroom. New* York: Longman.

Gunderson, O., Greenwald, S., Hedges, I., & Laine, G. (2012). *Bilingual and multicultural education: Canadian perspectives*. Clevedon: Multilingual Matters Ltd.

Hansen, (1976). *National plan for higher education*. Pretoria: Department of Education.

Harbison, R.W., & Hanushek, E. A., (1992). *Educational performance of the poor. Alexandria, VA: Association for Supervision & Curriculum Development.* New Jessy, Asman.

Hyde, Hanushek, A., & Hoffman, P. (2010). *Scaffolding language, scaffolding learning: Working with children in the mainstream elementary classroom*. Portsmouth, NH: Heinemann.

Jackson, A. (2009). *How to design and evaluate research in education* (8th Ed.). Boston; McGraw-Hill.

Jacobs, K., Kothari, Y., & Krueger, H. (2005). Styles of engagement with learning: Multidimensional assessment of their relationship with strategy use and school achievement. *Journal of Educational Psychology, 85*(3), 395-405.

Johnson, S. (2000). A cross-sectional cross-lagged panel analysis of mathematics achievement and attitudes: Implications for the interpretation of the direction of predictive validity. *Educational and Psychological Measurement, 41*, 829-834.

Joseph, P. (2013). *Principles and practice of education*. London, England: English Language Book Society.

Kangethe & Nafuko, 2000). The long-term effects of small classes: A five-year follow-up of the Tennessee class size experiment. *Educational Evaluation and Policy Analysis, 21*, 127-142.

Kariuki and Kibera (1996). Relationship between learning environment characteristics and academic engagement. *Psychological Reports, 8*(12), 12-34.

Kate, K., Christian, P., Morrison, U. T., & Brayn, S. (2002). *The teaching and learning*. New York; centre for Applied Research in Education.

Keith (2012). Interest, motivation and attitude towards Mathematics at K-12 levels: A systematic review of 12 years of educational research. *Studies in Science Education, 50*(1), 85-129.

Kochlar, H. (1992). Gender differences in Mathematics attitudes and the choice of technology-related occupations in a sample of secondary students in Spain. *Computers and Mathematics Education, 54*(2), 578-587.

Kupari M., & Nissinen, P. (2013). Mathematics attitudes of teachers and students in relationship to gender and grade level. *Journal of Educational Computing Research 3*(4): 479-494.

Lindberg, S. M. Hyde, J. S Petersen, J. L. & Linn, M. C. (2012). New trends in gender and mathematics performance: a meta-analysis, *Psychological Bulletin, vol. 136*(6), 1123–1135,.

Linder, J. (2000). *Students' perceptions of interest in reading mathematics:* boys. girls. or both? Paper presented at the annual meeting of the American Educational Research Association. Dallas.

Ma, S., & Kishor, W. (2016). The role of gender in computerised mathematics programming learning processes. *Journal of Educational Computing Research 1*(4), 441-458.

Mac-Nab, M., & Cummine, D. (1986). Students‟ actions and Mathematics teaching and learning: Two surveys of mathematics related attitudes. *Sex Roles 13*(4), 215-228.

Mahamood, H., Whitley, J. B., & Smith, S. (2012). Science, Mathematics and ICT (SMICT) education in Senior Secondary schools. Accra. pp. 15 – 17.

Maletsky, G. (1988). Predictors of Mathematics anxiety and performance in information system. *Computer in Human Behaviour, 12*(1), 67-77.

Manzo, J. (2008). Students‟ attitudes towards Mathematics and technology. *International Journal of Technology and Design Education, 25*(1), 43e65.

Marchis, X. (2011). Home and family influences on motivations for reading. *Educational Psychologist, 32*, 69-82.

Mata, C., Monteiro, J., & Peixoto, G. K. (2012). The impact of gender on interest in science topics and the choice of scientific and technical vocations. *International Journal of Science Education, 33,* 159-178.

Mefor, K. (2014). *A comparative study of students' achievement in English and mathematics in Addis Ababa, Amhara, Oromiya regional states of Ethiopia.* Unpublished Ph. D. dissertation. Addis Ababa University.

Mohamed, S. K., & Waheed, P. (2011). *Men and Women self confidence in persuasive, Control and justificatory communication tasks.* New Jessey, Princeton University Press.

Mubeen, E., Clark R. A., Colley, A. M. (2013). *I'm a stranger Here myself. A Consideration of Women in Engineering.* California, California University Printing Press.

Muro, Y. & Jeffrey, O. P. (2008). *Mathematics and girls: Rethinking the issues.* New Jessey, Princeton University Press.

Mutai, A. (2011). *Planning, producing and using instructional Media*. Utah, Utah State University Press.

Mwangi, D. (1983). *The cognitive consequences of instruction in Mathematics and Computerised Accounting*: Gender differences. Paper presented at the annual meeting of the American Educational Research Association, Long Beach, CA.

Neale, C. (2009). Sex equity: Increasing girls understanding of Mathematics. *The Computing Teacher*, *9*(8), 16-19.

Ngussa, J., & Mbuti, S. (2017). *Curriculum and instructions.* Owerri: Nigeria Versatile Publishers, pp 15-27.

Nunzia, A. (2017). *Teaching Mathematics*. Johannesburg; Witwater-Grand University Press.

Oketch, W. (1982). *The Nigerian new school curriculum: Issues and insights.* Ehindero (Nig.) Ltd., Jos.

Oluwole, M. (2001). Some Swaziland high school students‟ attitudes toward the study of mathematics. *Journal of the Southern African Association for Research in mathematics and Science Education, 2*(1), 33-38.

Onyango, I. M. 2003). *A study of attitudes of teachers and pupils toward teaching and learning of mathematics respectively in upper primary schools in Masimba educational zone, Irianyi division, Kisii district, Kenya*. Unpublished M. Ed project. Kenyatta University.

Orton, N. P. (1987). *Gender differences in mathematics achievement and self-concept at fifth, sixth, seventh and eighth grades: The case of Gonder Town.* Unpublished master‟s thesis. Addis Ababa University.

Orton, S. O. (1994). *Planning and implementing of policy in Nigeria education: Issues, problems and prospects.* Keynote Address Presented at the Annual Faculty of Education Conference Nnamdi Azikwe University, Akwa 31st July-3rd August.

Reid, S. (2006). *Managing change: An integral part of staff development. A Handbook of Effective Practices.* Oxford: National Staff Development Council.

Rodriguez-Brown, K. (2009). Research on curriculum and instruction implementation. *Review of Educational Research, 47*(1), 15-32.

Scafidi T. & K. Bui, (2010). Gender similarities in math performance from middle school through high school, *Journal of Instructional Psychology*, 37(3), 252–255.

Sechaba, L. & Moroke, O. (2000). *Examining the attitudes and outcomes of students enrolled in a developmental mathematics course at a central Florida Community College.* Scholars Commons, University of South Florida.

Supe, K. (2002). *Early years' teachers' attitudes towards mathematics.* Unpublished Master‟s thesis, Queensland University of Technology, Australia.

Voeten-Smith, H. (2004). *Influence of modern information technology device usage on family interaction in Adamawa State.* Unpublished M.Ed. thesis. Ahmadu Bello University. 28(1), 26–47.

Wachanga, N. (2004). Assessing the relationship between attitude toward mathematics and achievement in mathematics: a meta-analysis, *Journal for Research in Mathematics Education, 5*(12), 71-86.

Yang (2015). *Philosophy of educational research* (2nd ed.). New York: Continuum.

Yavoz, J. (1991). *Change: A Saskatchewan perspective. Presentation at League of Educational Administrators, Directors, and Superintendents Conference.* Swift Current, Saskatchewan.

APPENDIX A

INTRODUCTORY LETTER

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3rd August, 2022.

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

LETTER OF INTRODUCTION

I write to introduce to you, LOUIS SAVIOUR MENSAH, the bearer of this letter who is a student in the Department of Educational Foundations of the University of Education, Winneba. He is reading Post Graduate Diploma in Education with index number 190012867.

He is conducting a research on the topic: FACTORS INFLUENCING ATTITUDES TOWARDS MATHEMATICS AMONG JUNIOR HIGH SCHOOL STUDENTS IN SAMREBOI CIRCUIT GHANA. This is in partial fulfillment of the requirements for the award of the above mentioned degree.

He is required to gather data through observation for the said research and he has chosen to do so in your outfit.

I will be grateful if he is given permission to carry out this exercise.

Thank you.

Yours faithfully,

DR. RICHARDSON ADDAI-MUNUNKUM
AG. HEAD OF DEPARTMENT

APPENDIX B

QUESTIONNAIRE FOR JUNIOR HIGH SCHOOL STUDENTS

This questionnaire is meant to assess your opinion/views *on the* ***"factors influencing students' attitudes towards the learning of Mathematics among Junior High School students in Samreboi Circuit".*** This study is meant for academic purpose only. You are kindly requested to respond to the questions or statements honestly and precisely as possible. Your responses will be treated as confidential. Do not write your name on the questionnaire. Please respond to the questions/statements by a tick [√] in the spaces provided at the right-hand side of each question/statement that best apply to you.

SECTION A: RESPONDENTS' BIO-DATA

1. Sex: Male ( ) Female ( )
2. Age: Below 15 ( ) 15-18 ( ) 19 and Above ( )

Use the scale of Strongly Disagree (SD), Disagree (D), Agree (Agree) and Strongly Agree (SA) to respond to the questions/statements below:

SECTION B: PARENTAL RELATED FACTORS					
S/N	**STATEMENT**	**RESPONSES**			
3	My parents think mathematics doesn"t have any connection with the real life.	SD	D	A	SA
4	No matter how much time I spend studying mathematics, I can"t get better marks because my parents don"t like to help me.				

5	No matter how much time I spend studying mathematics, I can‟t get better marks because I have no one to help me at home.				
6	If I practiced more, I would have better results but I don‟t get any sufficient support at home nor from my parents.				
7	My family tells me that Mathematics is one of the most interesting school subjects to study.				
8	According to my parents, the topics covered in mathematics lessons are not interesting.				
SECTION C: TEACHER RELATED FACTORS					
S/N	**STATEMENT**	**RESPONSES**			
9	My teacher explains mathematics willingly to us.	SD	D	A	SA
10	My teacher encourages me, when I have difficulties with mathematics.				
11	My teacher encourages me, when we have difficulties with our mathematics assignments.				
12	My mathematics teacher is one of my favourite teachers.				
13	My teacher is a good mathematician.				
14	My teacher is a good at teaching us mathematics problems.				
15	Teachers have negative perception about our ability to study mathematics.				
16	Out teachers have lower perceptions of the girls‟ abilities than boys.				

SECTION D: CLASSROOM INSTRUCTIONAL FACTORS					
S/N	**STATEMENT**	**RESPONSES**			
17	We find it easy to ask our teacher when we don‟t understand something at mathematics classes, I ask my teachers immediately.	SD	D	A	SA
18	When I don‟t understand something at mathematics classes, I ask one of my colleagues in the break after the class with ease.				
19	Avenues are made possible in class for students who can‟t solve their homework,				
20	A student‟s natural predispositions for mathematics				
21	Insufficient teaching aids/resources for use by teachers and students.				
22	Teachers are not well preparations before entering the class.				
23	There is no/little cooperation between teachers and students in the mathematics class.				
24	The student‟s involvement in extra-curricular activities in school.				

Thank you.