

**GENDER DIFFERENCE ON ATTITUDE AND ACADEMIC PERFORMANCE
OF MATHEMATICS STUDENTS IN JUNIOR SECONDARY SCHOOL IN
BOSSO LOCAL GOVERNMENT OF NIGER STATE**

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ABSTRACT

The research work explored gender difference on attitude toward teaching and learning of mathematics in junior secondary school. A survey research design was used coupled absolute performance differences between males (boys) and females (girls). Data were collected through self-administered questionnaire with a five-point Likert scale was used. Three hundred and fifty students were used a sample size. The result was collected and analyzed using simple percentages, mean and standard deviation while hypothesis was tested using Chi-square and t-test tool. The research finds out that there is significant difference between males and females students attitude toward mathematics and that there is a significant difference of performance based on gender. A recommendation was made based on the research that Mathematics teachers should carefully identify students with more positive attitudes towards learning mathematics and encourage them, while those with more negative attitudes should be guided appropriately.

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CHAPTER ONE

1.0

INTRODUCTION

1.1 Background to the Study

Mathematics is an indispensable tool in the study of science, humanity and technology. It is the foundation for any meaningful scientific endeavor, and any nation that must develop in science and technology must have strong mathematical bedrock for its youths. (Uhumuarbi & Umoru, 2010). Mathematics being the rudiment of all science careers for example Medicine, Pharmacy, Engineering and so on., it therefore requires that every individual should have the knowledge of mathematics to function effectively and efficiently in today's world. This is true as Mathematics is one of the core subjects that is offered in both primary and secondary school systems irrespective of country or level of education. It has been described as a model of thinking, which encourages learner to observe, reflect and reason logically about a problem and in communicating ideas, making it the central intellectual discipline (Iji 2010).

The literal meaning of mathematics is “things which can be counted” therefore one can think that counting has vital role in our daily life, imagine that there were no mathematics at all, how would it be possible for one to count members of the family, number of students in the class, days in a week or in a month or years? On a basic level, one need to be able to count, add, subtract, multiply, and divide. At the psychological level, exposure to mathematics helps in developing an analytic mind and assists in better organization of ideas and accurate expression of thought. In terms of curriculum relevance, mathematics is compulsory at the post primary school level and a pre-requisite to moving from junior to senior secondary school as well as a subject required by the Joint Admission and Matriculation Board (JAMB) to gain admission into tertiary institution.

Despite the recognitions accorded to mathematics due to its relevance, Elekwa (2010) remarked that students exhibit nonchalance attitude towards mathematics, even when the student know that they need it to forge ahead in their academic pursuit and in life. Such students who have already conditioned their minds that mathematics is the most difficult subject are usually not serious in learning of mathematics and thus perform poorly in

mathematics assessment. This ugly trend of students' poor performance in mathematics has become a national disaster. Therefore, feasible ways of improving the performance has remained an area of great concern for researchers.

The problem of students' under-performance in secondary schools in Nigeria has been a much discussed educational issue. In solving any problem however, it is pertinent to understand the causes of such problems. Many causes or agents have been studied as the etiological starting point for investigating the phenomena of school failure or success. These causes are looked into from several perspectives including the role of the students, teachers, parents or family, school environment, society, government and so on. Notable works among these are effects of: students' study habits (Ayodele & Adebisi, 2013; Obasoro & Ayodele 2012), parents' economic status (Osonwa et al, 2013), continuous assessment (Kolawole & Ala, 2014; Okwu & Orum, 2012), educational funding (Ugwulashi, 2012). Nonetheless, there seems to be agreement among most authors to explain failure from a multi causal perspective where the phenomenon is analyzed at several levels, and where multiple variables are involved. Gender is one of such factors also mentioned in literature to have considerable effects on students' academic performances in science subjects especially mathematics. The importance of examining performance in relation to gender is based primarily on the socio-cultural differences between girls and boys. Some vocations and professions have been regarded mainly for men (engineering, arts and crafts, agriculture and others.) while some for women (catering, typing, nursing and others.). In fact, parents assign task like car washing, grass cutting, bulbs fixing, and climbing ladders to fix or remove things and so on, to the boys, (Umeoduagu 2010). On the other hand, chores like dishes washing, cooking, cleaning and so on is assigned to the girls. In a nutshell, what are regarded as complex and difficult tasks are allocated to boys whereas girls are expected to handle the relatively easy and less demanding tasks. As a result of this way of thinking the larger society has tended to see girls as a weaker sex". Consequently, an average Nigerian girl goes to school with these fixed stereotypes. In view of the belief that students' gender may have impact on the students' academic performance, this study will study the relationship between them if any.

Gender differences in performance have been examined for some time resulting in a substantial body of literature (Nenty 2010, Awofala, Adeneye & Apata 2011; Dania (2014); Agbaje & Alake, (2014); Atovigba et al, (2012). Gender is simply defined as the state of being either male or female. Many researchers pointed out that there is no significant gender difference in students' academic achievement and retention in various subjects while others found significant difference with either the boys or the girls performing better (Nneji, 2011 & Amosun 2011). So many factors had contributed to the varied conclusions arrived at by all researches. Some of such factors include campaign for, understanding and implementation of gender equality in the study area. Nigeria has been the site of numerous kingdoms and consists of several tribes with different sociocultural backgrounds and believes system, therefore, campaign, understanding and implementation of gender equality in different parts of the country varies from one place to another.

The literature has revealed that the role played by gender in mathematics education is multifaceted (Barkatsas, Kasimatis & Gialamas, 2009; Niederle & Vesterlund, 2010; Zakaria, Chin & Daud, 2010). This means that different reasons account for gender differences in attitude towards mathematics. The references above show that many reports of differences in mathematics performance related to gender have been presented over the past decades. In these reports, performance differences have been postulated to be due at least in part; to attitudinal differences regarding mathematics another reason for the varied conclusion is the subject on which the gender equality is being measured on. For example, there has been global concern about gender differences in students' performance in mathematics and some research have been undertaken in many parts of the globe in this respect. Although some researchers have found that there are no significant differences in male-female mathematics performance at any level, most have identified gender differences (Atovigba, 2012).

Another factor that determined the academic performance of students in mathematics is their attitude toward it. Attitudes towards mathematics such as anxiety (feeling of tension that hinder learning processes and performance), affective and behavioural engagement contribute to the effectiveness of learning process (Abebe, 2014). Attitude is a central

part of human identity. Every day people love, hate, like, favour, oppose, agree, disagree, argue, persuade, etc. All these are evaluative response to an object. Hence, attitudes defined as —A summary of evaluation of an object of thought‖ (Arhin&Offoe, 2015). It can also be referred to a positive or negative emotional disposition towards mathematics (Riegle-Crumb, Moore & Ramos-Wada, 2011). Attitude towards mathematics could be described as self-concept towards mathematics (believes about one’s ability to learn and person task).

There have been a lot of studies showing gender attitude towards mathematics in high schools. (Ganley and Vasilyeva; 2013) found that females tend to be more anxious towards mathematics than males. It has been shown that anxiety may impact mathematical performance due to the relationship between anxiety and working memory. Prior research suggests that —individuals with high anxiety would perform less efficiently on tasks requiring working memory resources because their worrisome thoughts interfere with working memory.

Moreover, interest and attitude in the subject area are the special predictors for the students’ participation and success in the subject Attitude has based on the value and beliefs as well as varying degree of factual knowledge (George & George 2012). It is on this base that the study seeks to find out the Gender difference on Attitude and Academic Performance of Mathematics Students in Bosso Local Government Area of Niger State.

1.2 Statement of the Research Problem

Mathematics is generally viewed as a difficult subject to all and more so to girls. While gender choices are made more freely today, inequity remains in science and mathematics occupations, healthcare and technology. Gender disparity in mathematics performance still persists in virtually all the schools in the country. The problem with gender difference could be that the students are having low self-esteem as they do not believe in themselves that they can do better no matter the type of gender. Favoritism in the aspect of the teacher could also be another problem: this is a situation whereby the teacher takes sides in making sure that a particular gender understands or get the sum better than the other gender, thereby leaving behind the other gender to suffer the ignorance due to lack of attention on the part of the teacher. Mathematics performance or achievement is the

attainment, accomplishment or successful performance in a mathematics examination, measured in scores that candidates obtain in an examination (Robinson &Lubienski2011). However the main aim of this research was to determine gender difference on attitude and academic performance of mathematics students in junior secondary schools in Bosso Local Government Area.

1.3 Aim and Objectives of the Problem

The main aim of the study is to determine the gender difference on the academic performance of mathematics students. Other specific objectives of the study include:

- i. To compare the performance of Male and Female students in mathematics.
- ii. To determine the attitude of Male and Female students towards mathematics.

1.4 Research Questions

- i. What is the difference in the attitude of Male and Female students towards mathematics?
- ii. What is the difference in the academic performance of Male and Female students in mathematics

1.5 Research Hypotheses

H1: There is no significant difference in the attitude of students toward mathematics based on gender.

H0: There is no significant difference in the academic performance of students in mathematics based on gender.

1.6 Significance of the Study

The findings of the study will add to the pool of academic knowledge in mathematical areas. It is hoped that the study will be helpful to students, classroom teachers and the society

The research will help to change the attitude of the students, improve their performance and also help them see mathematics as a less difficult subject. It will also encourage them to believe in themselves and do better not minding their difference in gender.

The research will be helpful to teachers in an effort to improve teaching of mathematics and improving learners' involvement in mathematics curriculum. The results will enable teachers to evaluate their teaching approaches and adopt those which improve performance in mathematical instructions. In addition, they will realize the importance of being sensitive on gender to avoid bias.

The research will help change the perception of the society from seeing one sex as a weaker sex, and also encourage both sexes to performance better in mathematics.

1.7 Scope of the Study

The study examined gender difference on the academic performance of mathematics students is limited to three selected secondary schools in Bosso local government area, Minna.

1.8 Definition of Terms

- i. **Gender:** The state of being male or female
- ii. **Academic Performance:** Is the extent to which a student, teacher or institution has achieved their short or long-term educational goals.
- iii. **Student:** Is primarily a person enrolled in a school or other educational institution who attends classes in a course to attain the appropriate level of mastery of a subject under the guidance of an instructor and who devotes time outside class to do whatever activities the instructor assigns that are necessary either for class preparation or to submit evidence of progress towards that mastery.
- iv. **Attitude:** Opinion or way of thinking. Generalized feelings towards a particular object, subject or situation.
- v. **Performance:** Accomplishment in a particular area of a course, usually by reasons of skills hard work or interest and attitude.

CHAPTER TWO

LITERATURE REVIEW

2.0

This chapter contains the review and discussion of relevant literatures related to the study. The review was carried out with respect to the following sub-themes: Conceptual Framework, Theoretical Framework, Empirical Studies and Summary.

2.1 Conceptual Framework

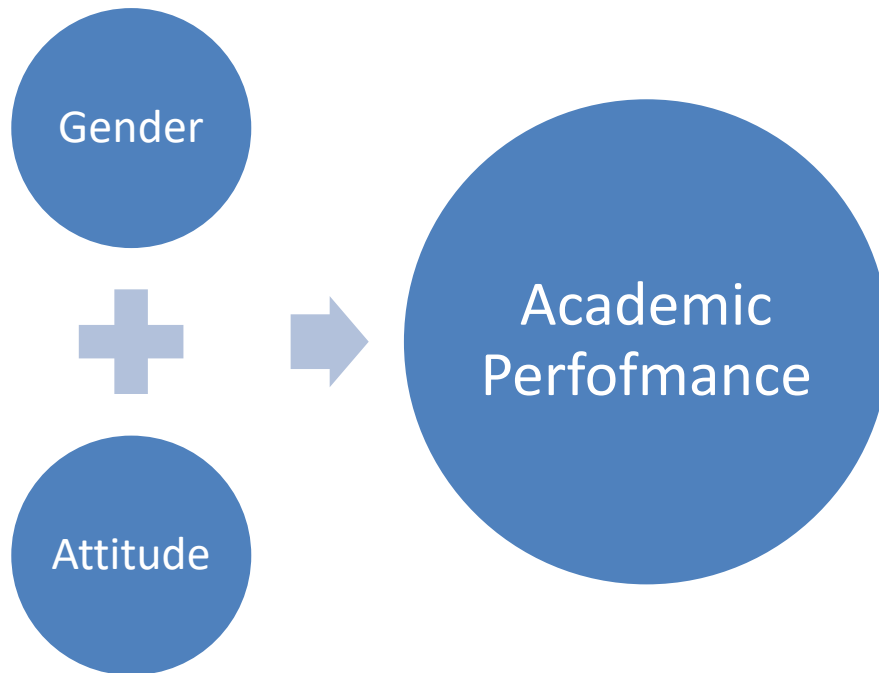


Figure 2.1

A Schematic Diagram Showing the gender and student's attitude on junior secondary School Students (JSS3) academic performance in mathematics

2.1.1 Concept of Gender Differences

The concept of gender is usually referred to the sexual and physical distribution between male and female. It is a biological phenomenon with respect to appearance and sexual characteristics. However, psychologist and other individuals belonging to the social school of thought refers to the term "gender" to be a social construction of individuals rather than just a biological phenomenon (Kyei *et al.*, 2011). In other words, is not just about being born or having the characteristics of either a male or female but it rather involves how an individual is formed or influenced through social interactions as well as the various roles, behaviours and mannerisms towards both sexes as ascribed by the

society (Nnamani & Oyibe, 2016). As a result, differences have been observed in both behaviour and cognition as pertaining to gender. Ajai and Imoko (2015) observed that, differences due to the discriminatory characteristics of gender ranges from sex to social role and to gender identity.

Data from the United Nations Department of Economic and Social Affairs (UNDESA, 2010) states that of the 774 million illiterate adults, two-third of that number is made up of women which implies a great gap between gender in education. This gap is significantly translated even into the primary, secondary and tertiary education between boys and girls. According to the Organization for Economic Cooperation and Development (OECD, 2011) this differences between boys and girls is more prevalent in secondary schools. Zacharia (2014) in her research reported that girls have been continually disadvantaged when compared to boys at both primary and secondary levels in all educational areas, participation and performance.

Gender differences in attitude in mathematics do not have only theoretical connotations and significance but has also gain attention in empirical literature. For instance, Oludipe, (2012) in his study on gender differences in schooling experiences of adolescent in low income countries, noted that in low performing schools, teachers tend to think that mathematics is somewhat important for boys. According to Pahlke, et al (2014) and Mutai (2016), learning mathematics by girls may be inhibited by the presence of boys. Moreover, Mbuthia(2011) found that female students performed better than the male counterparts in mixed secondary schools, while male students recorded a better performance compared to their female counterparts in single sex secondary schools. Concentrating on a different perspective, Ajai and Imoko (2014) in their research on mathematics self-concepts (MSC) and student's motivation to learn mathematics (SMOT) conclude that student's mathematics self-conceptions related to their motivation to learn mathematics. Gender differences, favouring boys, exist in students' perception of likelihood of success, and satisfaction in learning mathematics. The researchers also concluded that students' MSC is differentiated by gender, school social setup and grade level and that girl in coeducational secondary schools have the least self-concept and motivation to learn mathematics. Hlalele (2012) also stated that the female students' attitude towards mathematics is more positive than the male students. Students'

perception of parental, teachers and peer expectations were found to significantly influence gender differences and attitudes towards learning of mathematics.

These empirical literatures give conflicting findings on gender attitude towards the study of mathematics.

Better yet other studies have found a significant difference between males and females towards mathematics (Ajai&Imoko, 2014). Other studies have also showed that there is no significant difference between attitude towards mathematics among male and female students (Mata et al, 2012; Mohd, Mahmood& Ismail, 2011). Some have also demonstrated that there is a difference between attitude in the lower level and when students get to upper level (Mohamed &Waheed, 2011). A critical evaluation of these studies provides that students' attitude towards mathematics are very subjective and varies among the students. These inconsistencies need to be resolved to find out the direction of gender difference towards mathematics among students.

2.1.2 Gender Attitude

Gender attitude towards mathematics could be described as self-concept towards mathematics (believes about one's ability to learn and person task). Moreover, mathematics anxiety (feeling of tension that hinder learning processes and performance), attitudes towards mathematics, affective and behavioural engagement contribute to the effectiveness of learning process (Abebe, 2014). Attitude is a central part of human identity. Every day people love, hate, like, favour, oppose, agree, disagree, argue, persuade, etc. All these are evaluative response to an object.

Hence, attitudes defined as —A summary of evaluation of an object of thought (Arhin&Offoe, 2015). Attitudes towards mathematics can referred to a positive or negative emotional disposition towards mathematics. There have been a lot of studies showing gender attitude towards mathematics in high schools. Ganley and Vasilyeva (2013) found that females tend to be more anxious towards mathematics than males. It has been shown that anxiety may impact mathematical performance due to the relationship between anxiety and working memory. Prior research suggests that —individuals with high anxiety would perform less efficiently on tasks requiring working memory resources because their worrisome thoughts interfere with working

memory. Other researchers had agreed that attitude towards the learning of mathematics becomes increasingly less favourable beginning from the early elementary early junior high school for boys and girls (Kebede, 2007). In addition to this many research studies had been done on comparison between female and male students "attitude towards mathematics and suggested that there is no significant difference between attitude towards mathematics among male and female students (Mohamedd et al, 2011).

Moreover, interest and attitude in the subject area are the special predictors for the students" participation and success in the subject Attitude has based on the value and beliefs as well as varying degree of factual knowledge (George & George 2012). Attitudes towards mathematics can referred to a positive or negative emotional disposition towards mathematics (Riegle-Crumb, Moore & Ramos-Wada, 2011). According to Karimi and Venkatesan (2009), significant gender differences found in several areas, and attitudes variables found to be useful in predicting grades.

In study that involved 847 students of grade, 8 to 11 in North shoa zone Robinson and Lubienski(2011) found no gender difference in attitude towards mathematics among eight graders. None, he found significant gender differences in favor of boys at subsequent grade level (9, 10 and 11). Some studies have employed subscale measures of attitudes toward mathematics Devineet al (2012) examined gender difference among junior school students they found significant differences favoring males on two subscales. Other researchers had agreed that attitude towards the learning of mathematics becomes increasingly less favorable beginning from the early elementary early junior high school for boys and girls (Kebede, 2007). In addition to this many research studies had been done on comparison between female and male students "attitude towards mathematics and suggested that there is no significant difference between attitude towards mathematics among male and female students (Mohamedd et al, 2011). This study operationalizes attitude using facets such as gender interest, confidence, fear, competence and success

2.1.3 Factors Influencing Gender Differences

Zacharia (2014) outlined the following factors as influencing gender differences in education;

Gender Stereotypes

The negative social attitudes which generally put boys ahead of girls have not helped in bridging the difference between genders. Most times, girls are meant to do domestic chores which are more or a routine compared to the activities of boys which are sort of seasonal. More prestige is often ascribed to the roles of males than females such that it is derogatory for a male to perform roles that are female stereotyped whereas it is a thing of prestige for a female to perform the roles of a male. Even in education, these stereotypes are observable when teachers with no gender sensitivity would conclusively consider boys more intelligent than girls without any prior test of knowledge.

Socio-Cultural Factors

Socio-cultural practices have proved to be a major setback to girls' education, as most African cultural ideologies always seem to bent in favour of the boys neglecting the girls. Traditional gender roles would encourage or force girls into marrying early as a means of preventing early pregnancy which is abhorred in most African setting or as a means of reducing economic burden of the family.

Socio-Economic Factors

Studies across several African countries suggest that a major factor influencing access to education in Africa is poverty. As a result, when the incomes of most African families become low, girls are often withdrawn from schooling while the boys are left to continue thereby creating a gap. Sometimes, girls are seen as a means of supplementing family income and are thus easily withdrawn from school when they attain the age of marriage to either sell, farm or perform other activities that is sure to bring in money.

School Infrastructure

The availability of adequate school facilities also plays a part in gender differences by keeping girls away from school and affecting their behaviours towards academics as well. Mature girls are most likely not able to comfortably

carry out their studies due to the absence of adequate latrines especially separate latrines for girls.

Parental Factors

The level of education of parents, their occupation and level of support given towards education of their children would also affect gender difference. The decision to educate girls most times would depend on the level of education of the parents. According to a report by the United Nations Children's Education Fund (UNICEF, 2014), an educated mother is most likely to ensure the education of her children even beyond her level of education.

Low Motivation

Motivation remains a vital key for improving academic performance. The lack of female teachers as role models would mostly likely impede the quality of education a girl experiences. The absence of female teachers often breeds inferiority complex and low concentration towards their academics in other words poor achievement. Bamora (2010) observed that girls are sometimes stereotyped in school into doing chores for the teachers at school such as fetching water. Furthermore, she reported that boys are more praised for their active participation in classroom lessons compared to girls who are mostly commended on account of their good behaviour alone. Generally, passive behaviour is promoted amongst girls whilst assertive behaviour is promoted in boys.

2.1.4 Attitude

According to Mutai (2010), attitude can be referred to a state of readiness and inclination to either act or react in a definite manner when faced with certain stimuli. In relation to learning, it is viewed as a feeling towards someone or something which is often times translated in the behaviour of an individual as either positive or negative. Furthermore, attitudes formed by an individual are largely dependent on the experience of such an individual within the learning environment and these attitudes enhanced by interpersonal interaction.

The following factors play a vital role in influencing the attitude of an individual towards learning in general and mathematics performance in particular

2.1.4.1 Parental Influences

Mahamood *et al.*, (2012) observed that parental influences can either directly or indirectly affect the attitudes of students towards mathematics. They noted that direct influences could be through parental assistance towards their mathematical difficulties while indirect influences would come in the form of parental expectations and encouragement as well as their personal attitudes towards mathematics. They further revealed from their study that parents are a powerful and positive source of influence on the academic achievements of adolescents.

2.1.4.2 Teacher Affective Support

Marchis (2011); Sakiz *et al.*, (2012) in their studies stated that teachers' support is essential for the encouragement of positive attitudes towards mathematics. The strong influence which teachers have on the beliefs of students in their mathematical competency connotes the vital role played by teachers in mathematics classrooms which leads to improvement of students' performance in mathematics (Berends *et al.*, 2012). Teacher support significantly affects the academics of students, behavioural, motivational and emotional outcomes in educational environment. The components of Teacher Affective Support include concern for, interest in students, caring, respect, valuing, listening, encouragement, fair treatment and high expectations (Davadas & Lay, 2018).

2.1.4.3 Classroom Instruction

Classroom processes serve as medium by which students' achievement related behaviour, students' attitudes and teacher attitude can affect student achievement (Davadas & Lay, 2018). Classroom instruction is a broad term which encompasses instructional materials and equipment

and strategies used during the teaching learning process in the classroom (Tessema, 2010). Schukajlow *et al.*, (2012); Hodges and Kim (2013) noted that the choice of instructional strategy can influence the attitudes of students towards mathematics.

Students' achievement related behaviour, students' attitude and teacher's attitude may change as the students and teachers interact in the classroom. Tessema (2010)

outlined the following instructional strategies as providing multiple opportunities for students to learn: modeling, cooperative learning, student-centered, spatial thinking and collaborative discussion. Positive attitudes of students towards mathematics can be potentially impacted upon by these instructional practices.

2.1.5 Academic Performance

Academic performance refers to the quality and quantity of knowledge, techniques, skills as well as positive attitudes, philosophy and behaviour which students acquire or achieve (Mwiigi, 2014). The level of academic performance is determined by the number of students and quality of grades attained on evaluation after a term or educational cycle. A number of factors affect academic performance as to either good or poor such as home environment, teaching methods, quality of students, sex differences, and available scholastic materials, involvement of teachers in academic matters and the nature of administration. However, among all these, sex differences seem to be a critical factor which affects students' academic performance.

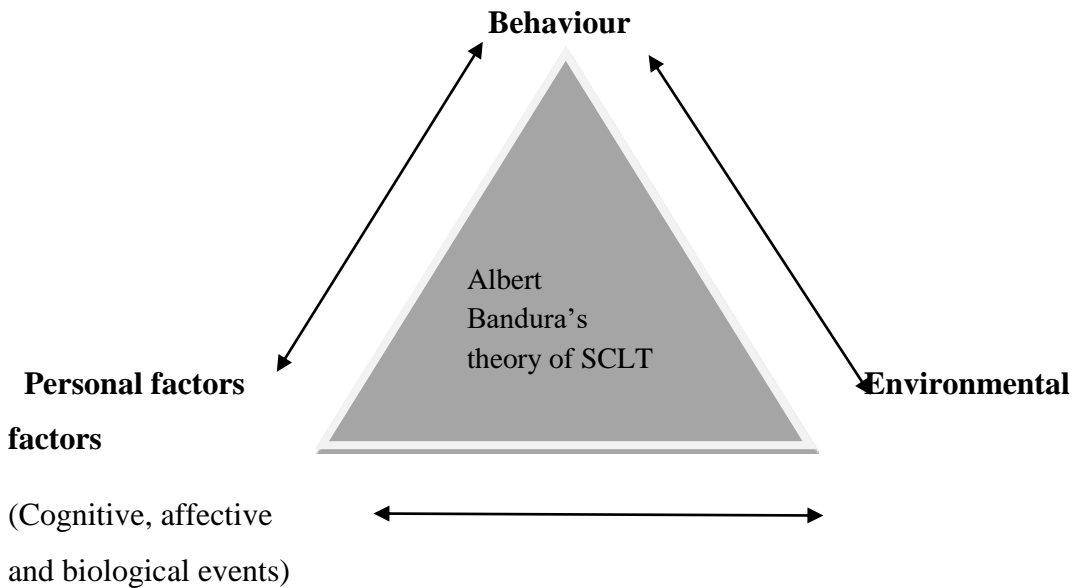
2.2 Theoretical Framework

The theoretical framework of this study is based on the social cognitive learning theory of Albert Bandura (1999). He stated that human nature is considered as a massive potentiality which can be moulded by direct and indirect experiences into a diversity of forms within biological limits. He pointed out that observing the behaviour of others, without being directly forced, individuals learn both behaviour and cognitive strategies. Nabavi (2012) in agreement with the theory of Bandura (1999) outlined the following cognitive features as influencing behaviour in social cognitive learning theory (SCLT):

- i. How new information is cognitively processed is affected by our expectations of future consequences;
- ii. Vicarious experience of others' consequences;
- iii. Responses based on current situations and expectations of future consequences;
- iv. Non-occurrence of expected consequences have effect; and

- v. Decisions about how to behave is affected by expectations.

Bandura (1997) opined that people are but partial products of their environments and as such we can influence what we become by carefully selecting our environment. Our beliefs and capabilities are influenced by our choices. Nabavi (2012) in support of the triadic reciprocal principle of Bandura, defined human behaviour as a triadic, reciprocal and dynamic interaction of the environment, personal factors and behaviour. These three are reciprocal nature as shown below



2.2.1 Theories on Attitude

Attitude is a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour (Eagly & Chaiken, 1993). It is a predisposition or a tendency to respond positively or negatively towards a certain idea, object, person, or situation or an attitude object. Attitude influences an individual's choice of action, and responses to challenges, incentives, and rewards (Business Dictionary). Zelle, Marianne and Elaine (2005) postulate that attitudes are generally positive or negative views about a person, place, thing or event which are often referred to as the attitude object. Arul (1995) quotes Allport's definition of attitude as a mental and neural state of readiness organised through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related. Implicit in the various

definitions is that attitude is a psychological orientation developed as a result of one's experiences, which influences how a person views situations, objects or people, and how she appropriately responds to them. The response may be positive or negative; favourable or unfavourable; neutral or ambivalent.

2.2.1.1 Components of Attitude

Research suggests that there are three different components of attitude. These are the cognitive component, the affective component, and the behavioural component (Eagly & Chaiken, 1993; Maio & Haddock, 2010). The cognitive component of attitude is what the individual thinks or believes about the attitude object. An example is that a person might think that a snake is a dangerous reptile. The affective aspect of attitude is the feelings or emotions of the individual associated with the attitude object. For example, the sight of a snake may evoke the feeling of fear in the individual. The behavioural component is the tendency to respond in a certain way to the attitude object. An example is a person choosing to run away or scream upon seeing a snake. Hence the cognitive, affective and behavioural components of attitude are interrelated and interconnected.

2.2.1.2 Formation of Attitude

Research has shown that formation of attitude is experiential. People form attitudes through their experiences in life. Social psychology explains how attitudes are formed using three major learning theories which are classical conditioning, operant conditioning and observational learning. Propounded by Ivan Pavlov, classical conditioning is a procedure for modifying behaviour in which repeated pairing of conditioned stimulus with an unconditioned stimulus leads to the development of a conditioned response (Ntim, 2010, Linero & Hinojosa, 2012). Classical conditioning entails neutral stimuli that naturally elicit a response. Children, for instance, become fans of football clubs of their fathers. They grow up believing that those particular football clubs are the best and develop the same passion for the clubs. Hence, we form attitudes according to how we are conditioned or how our experiences condition us. B.F. Skinner's Operant Conditioning theory is a form of learning in which a response is made in anticipation of a stimulus. In operant conditioning, reinforcement increases the likelihood that behaviour will be repeated (Ntim, 2010). Behaviours that are followed by positive consequences are reinforced and are more likely to be repeated than are behaviours and attitudes that are

followed by negative consequences (Moris & Maisto, 2001). Operant conditioning requires the use of reinforcement and punishment. A case in point is if a child's mother smiles at her anytime she picks something up for her, the child begins to realise that it is good to be helpful and she is likely to repeat the behaviour. Conversely, if a mother screams at a child for picking up a puff of a piece of cigarette, the child will grow up having an unfavourable attitude towards smoking and probably those who smoke. This is due to the negative consequence of her action. Finally, people also learn attitude through observation of people around them, especially if they are people they admire, respect or hold in high esteem. Children therefore invariably observe the attitude of parents and teachers and learn a lot from them. Observational learning theory propounded by Albert Bandura posits that behaviours are acquired by watching another or the model that performs the behaviour (Yara, 2009). The model displays the behaviour and the learner observes and tries to imitate it. Teachers are, invariably, role models whose behaviours are easily copied by students.

Attitude towards Mathematics has cognitive, affective and behavioural components; and like any other kind of attitude, it can be formed through any of the three processes described earlier. A student can develop positive attitude towards Mathematics because he or she learns to associate positive experiences or events with it. Also, positive reinforcement creates room for the formation of positive attitude for Mathematics. And by no means is students' observation of teachers and teachers' behaviour especially in relation to Mathematics among the least of the factors that influence their attitude towards Mathematics.

2.2.1.3 Student Attitude towards Mathematics

The conceptions, attitudes, and expectations of students regarding Mathematics and Mathematics teaching have been considered to be very significant factors underlying their school experience and achievement (Borasi, 1990; Shoenfeld, 1985). In general, the concepts students hold about Mathematics determine how they approach the subject. In many cases, students have been found to approach Mathematics as procedural and rule-oriented. This prevents them from experiencing the richness of Mathematics and the many approaches that could be used to develop competence in the subject. Attitude can

also be gender related. There are many who hold the view that boys do better in Mathematics than girls. This belief tends to affect the attitude of girls towards Mathematics. Farooq and Shah (2008) in a study of secondary school students in Pakistan found that there was no significant difference in confidence of male and female students towards Mathematics at secondary school level. They rather found that students' success in Mathematics depended on attitude towards the subject. Nonetheless, some studies have found gender difference in students' confidence in Mathematics. Compared to boys, girls lacked confidence, had debilitating causal attributional patterns, perceived Mathematics as a male domain and were anxious about Mathematics (Casey, Nuttal & Pezaris, 2001). In the study, girls were found to have lower self-confidence in Mathematics than boys. Instructively, research on the relationship between student attitude and performance has also been inconclusive. Researches that have been conducted to determine the relationship between students' attitude towards Mathematics and achievement in Mathematics have yielded contradictory results. The findings have thus lacked consistency on the subject. Some studies have demonstrated a strong and significant relationship between Mathematics attitude and Mathematics achievement (Minato & Yanase, 1984, Randhawa & Beamer, 1992, Schenkel, 2009). In the Schenkel's (2009) study of elementary school pupils, positive correlation between student attitude and student performance was found. Student beliefs and attitudes were found to have the potential to either facilitate or inhibit learning. In a comparative study of factors influencing Mathematics achievement, Burstein (1992) found that there is a direct link between students' attitudes towards Mathematics and student outcomes. Cheung (1998), in his study of 11-13 year olds, also discovered positive correlation between attitude and Mathematics achievement. The correlation showed that the more positive the attitude, the higher the level of achievement in the student.

2.2.2 Social Cognitive Theory

This theory is explored to unearth attitudinal factors which may breed gender differences and influence gender attitude towards the study of mathematics. The social cognitive theory is a phenomenon in psychology that attempts to explain thought processes of individuals in order to understand human behavior (Stevens, 2013). The prevalent aspects

of cognitive theory involve the interaction between mental components of students in their learning process and the information that is processed through this complex network. The social cognitive theory revolves around the notion that if we want to know what makes people think the way they do or behave in a particular direction then we need to understand the internal processes of their mind.

Cognition literally means —knowing|. In other words, social cognitive refers to the study of human mental processes and their role in thinking, feeling, and behaving (Mazziotta, Mummendey& Wright, 2011). Taking a prospective look at the learning and internal processes of the mind of students, the cognitive theory assumes that when such internal thinking is properly shaped, it helps the individual to be properly fit into whichever environment that such individual finds themselves. In the view of Clark and Beck (2010), shaping the thinking of individuals involves undertaking a comprehensive training and developmental process of such individuals. Inferring from the information above, it could be observed that the mental processes of individual who according to the definition of cognition aid in —knowing| stems from enabling environment. Gender differences in attitude could create environment for differences in gender dispositions towards studying mathematics. This means that gender attitudinal differences could affect how students' cognitive power is shaped and subsequently affecting their attitude. Some of these attitudinal factors are gender interest, gender confidence, gender fear, gender competence and gender success.

2.3 Empirical Studies

2.3.1 Gender Differences on Attitudes of Mathematics Students

Mutai (2010) studied attitudes among students towards mathematics learning and performance. 66% and 34% boys and girls constituted the population of his study. Findings from his study revealed that lack of confidence, lack of interest in mathematics and inadequate learning resources are the major problems affecting students' attitudes towards mathematics. From his study 76% of the population were of the opinion that gender difference had no influence on the the attitudes of mathematics students. Kyei *et al.*, (2011) observed in their study that the attitudes and interest of students in

mathematics was influenced by teaching methods employed by the teacher and personal interest.

2.3.2 Gender Differences on Academic Performance of Mathematics Students

In her study on gender differences among secondary school students' mathematics performance (Mutai, 2016) revealed that gender has a strong association with mathematics. Boys had a stronger affinity and interest in mathematics and hence performed better than girls. The findings of Mutai (2016) were in concordance with the results of Mwiigi (2014) who observed that gender differences had an impact on secondary school students' academic performance. Her studies pointed out that on subject basis, girls out performed boys in languages while boys were better off than girls in sciences. However, in terms of overall academic performance boys performed significantly better than girls. Findings revealed that these gender differences were influenced by negative attitudes and behaviours, inadequate facilities, dissatisfaction and lack of motivation in girls, inferiority complex, low persistence and irregular attendance to school by girls. Similarly, Asante (2010) reported significant difference the mathematics performance of boys and girls. The difference in mathematics performance was ascribed to be due to socio-cultural factors.

The findings of Nnamani and Oyibe (2016) showed the existence of significant gender difference in academic achievement. Results of their work on gender and academic achievement of secondary school students in social studies in Abakaliki Urban of Ebonyi State showed that female students had higher mean achievement score than male students. They further observed an intricate relationship existing between the impact of male and female teachers on the achievement of male and female students. Higher mean scores were obtained from male and female students taught social studies by male teachers compared to male and female students taught social studies by female teachers. They also observed that male students taught social studies by female teachers performed better than female students taught social studies by female teachers while female students taught social studies by male teachers performed better than male students taught social studies by male teachers.

However, the results of Umar *et al.*, (2015) disagreed with previous findings. They observed from their study that there was no significant difference between gender and academic performance of students in Colleges of Education in Borno State.

Similarly, according to Mata, Monteiro, & Piexoto (2012), gender differences in attitudes towards learning are a recurrent theme throughout the literature in academic studies in general and in mathematics studies in particular. Mathematics is often considered to be a domain in which boys are higher achievers, both in terms of attitudes and self-concept. But contrary to this notion, findings from other researches show that mathematics achievement and grades do not differ significantly between boys and girls (e.g., Scafidi & Bui, 2010, Lindberg, Hyde, Petersen, & Linn, 2010). This similarity between the performance of males and females is clear in the meta-analysis conducted by Lindberg, Hyde, Petersen, & Linn, (2010). In their study, they gathered data from 242 different studies, totaling 1,286,350 students. The findings indicated that there were no significant gender differences, hence nearly equal male and female variances.

On students' performance analysis, the class of the student, the number of educated people in the student's house and the sex of the student were found to be linearly related. Furthermore, perceived gender difference caused school drop-out and poor choices of girls relative to boys. It was inferred that, this aspect of the study, for gender equity in decision making cannot be achieved once gender difference in mathematics ability of boys and girls is not resolved.

Also, the capacity to educate pupils from the elementary schools will remain incomplete as women always passed on these perception and belief to younger generation even before they start to make their own choice in academics.

It could be observed that Kyei et al (2011) focused on the cause of gender differences among students in mathematics. The study failed to establish the differences before going on to investigate the cause of then differences. The current study extends the literature of Kyei et al (2011) by first examining gender difference and attitude towards the study of mathematics before any further study on the cause could be recommended.

In Kenya, Owiti, (2011) conducted a study using a sample of 205 form three students (126 girls and 79 boys) tried investigate whether there was any significant gender difference in attitudes toward mathematics. Questionnaires and face to face interviews

were used in data collection. Descriptive (%) and inferential (chi-square and z-statistic) statistics were then used to analyze the data. The findings of the study indicated that more boys than girls (93.7% of boys compared to 59.5% of girls) had positive attitudes toward mathematics while more girls than boys (35.7% of girls compared to 6.3% of boys) were negatively oriented toward mathematics. Calculation of z-statistic confirmed that the difference between the two means was significant.

Chi-square calculation showed a significant relationship between sex of student and attitude held. Based on the findings, it was concluded that significant gender differences in attitudes toward mathematics existed among students of secondary schools in Eldoret municipality and that closure of the sex differential gap could help see girls perform better in mathematics as well. The basis of Owiti's (2011) study provides directions for the current study. It has similar focus to current study. Therefore, apart from the face to face interviews, the questionnaire instrument used is adopted for gathering data on gender differences in the Cape Coast metropolis. The findings from Owiti's (2011) study may be important for empirical comparison with the findings in this current study. Similar to the study of Kyei et al (2011), Mata, Monteiro and Peixoto, (2012) study on attitudes towards Mathematics: Effects of Individual, Motivational, and Social Support Factors.

Perhaps the most comprehensive study on gender differences and attitude towards mathematics in recent times is the study conducted by Mutai (2016) in Kenya. This study focused on the gender differences in performance in mathematics among form three secondary school students in Bureti Sub-County. It focused on the influence of students' perception, parental expectations, teachers' characteristics and perceptions and school environment on their learning of mathematics. The study was a cross-sectional descriptive survey employing correlation methods to investigate gender differences in Mathematics achievement levels of girls and boys. A total of 430 students responded to a five-item, mathematics Achievement Test (MAT) comprising statistics and probability questions.

2.4 Summary

In line with the review of relevant literatures done above, the purpose of this study is explained in this chapter. It was observed that gender differences play a role in

influencing the attitudes and academic achievement of students in mathematics in secondary schools.

Gender refers to a social concept of roles and behaviour and the relationship which exist between men and women and boys and girls in a society. Differences occur in the roles and behaviour of particular gender. These gender differences are observed to be influenced by Socio-cultural factors, Socio-economic factors, Stereotyping, low motivation, parental factors and school infrastructure. One or more of the above factors play a part in affecting the attitudes towards mathematics and the academic achievement of students in mathematics as revealed by a number of studies.

From the review carried, it is worthy to note that whilst some researchers observed gender differences to significantly affect attitudes and academic achievement conflicting observations were also made by others. Hence the importance of this study, so as to add to the existing body of knowledge towards drawing a definite conclusion on the role gender differences play in influencing the attitudes and academic achievement of students in mathematics.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

This chapter will describe the method to carry out the study. The description comes up under the research design, population, sample and sampling techniques. These chapter deals with the research methodology which comprises of data collection, validity and reliability of the instrument, data collection procedure and procedure for data analysis as follows; research design, population of the study, sample and sampling techniques, instrumentation, procedures for data collection and procedure for data analysis

3.1 Research Design

The researcher adopted a sample survey research design. The comparative analysis was achieved by means of utilizing Chi-square for hypotheses one and t-test for hypotheses two. While, the research questions were answered by descriptive statistics: Mean and Standard deviation where the mean of 3.0 is set as the scale mean. Any mean less than 3.0 will be rejected while mean greater than or equal to 3.0 will be accepted.

3.2 Population of the Study

The population this study comprises of all the JSS3 school students in Bosso Local Government, Niger State. Niger state comprises of twenty one schools with a total population of three thousand and seventy four (3074).

3.3 Sample Size

The research sampled three hundred and fifty students from the entire population.

Table 3.3.1 Distribution Table of Sample Size

GROUP	TOTAL
School A	87
School B	87
School C	80
School D	90
TOTAL	350

*Source: Niger State Ministry of Education

3.4 Instrument for Data Collection

The instrument used to collect data in this study was a structured questionnaire only. The instrument was designed by the researcher and was approved by the supervisor. It is a questionnaire for students of the selected schools and it is subdivided into two (2) sections as follows; Section A: Bio-data of students, Section B: factors affecting the attitudes of students and Section C: Gender difference on attitude and academic performance in mathematics. The questionnaire is made of fifteen items. The following acronyms were used: SD – Strongly Disagree, D – Disagree, U – Undecided, A – Agree and SA – Strongly Agree.

3.4.1 Validity of the Research Instrument

The instrument was designed by the researcher and approved by the supervisor. The content of the instrument was validated by the supervisor and some other two lectures from the department. Hence, the instrument contains element of validity.

3.4.2 Reliability of the Research Instrument

The questionnaire has a Cronbach's alpha coefficient of .78

3.5 Method of Data Collection

Likert scale questionnaire was used to generate data for this research work. The questionnaire comprises of three sections. Section A carries the bio-data of students, Section B attends to the issue of gender difference on academic performance of students

in mathematics which is made up of ten (10) items that require the following response SD – Strongly Disagree, D – Disagree, U –Undecided, A – Agree and SA – Strongly Agree while the last section which is section C contains a Mathematics Performance Test (MPT) and was administered to both students. Also due to the nature of the research, it will assist immensely in generating accurate and firsthand information from the questions the respondents were given to answer.

3.6 Method of Data Analysis

The data collected will be analyzed using the statistical package for the social sciences (SPSS) version 22.0 computer program for windows. The alpha level was set at .05 for tests of significance. Hypotheses was tested using Chi-square for hypotheses one and t-test tool for hypotheses two all from SPSS.

CHAPTER FOUR

4.0 ANALYSIS, RESULTS AND DISCUSSIONS

The purpose of this research is to find the gender difference and attitude on academic performance of mathematics students. This chapter includes the result of the procedures used to answer the two research questions and test the two hypotheses. The result includes statistical significance whether the null hypotheses were accept or rejected. The data generated were collected and tabulated. The research questions were answered using percentages, mean and standard deviation while the hypothesis was tested using t-test tool tested at 0.05 levels of significances all using the IBM SPSS statistics package version 22.0.

4.1 Gender of Students

Gender	frequency	percentage	Cumulative percentage
Male	150	42.9	42.9
Female	200	57.1	100
Total	350	100	

Table 4.2 shows the gender distribution of the respondents. From the table we can see that male has the frequency of one hundred and fifty (150) respondents which represent 42.9% of the population, while the female had the frequency of two hundred (200) which is equivalent to 57.1% of the total population.

4.2 Research Question One

What is the difference in the attitude of Male and Female students towards mathematics?

Table 4.2 Distribution Table of Students Attitude towards Mathematics

SN	Items	Gender	SA %	A %	U %	D %	SD %	M	ST.D	REMARK
1	Learning mathematics help me learn other subjects.	M	81.3	7.30	0	0	11.3	4.47	1.27	Accepted
		F	46.5	33.0	8.50	7.5	4.50	4.10	1.12	Accepted
2	Mathematics classes/lessons are not interesting	M	8.0	8.0	28.0	30.7	25.3	2.43	1.18	Rejected
		F	11.0	11.0	19.5	43.0	25.5	4.47	1.28	Accepted
3	Among the subjects taught, mathematics is my favourite	M	62.0	26.7	8.7	1.3	1.3	4.15	.82	Accepted
		F	44.0	37.0	10.0	8.0	1.3	2.39	.96	Rejected
4	I feel extremely anxious and fearful, when mathematics examinations are mentioned or brought	M	28.7	20.7	24.0	22.0	4.7	3.47	1.25	Accepted
		F	16.5	36.0	13.5	24.0	10.0	3.25	1.27	Accepted
5	I learn mathematics only because it is compulsory	M	4.47	8.7	4.7	14.0	7.3	2.11	1.39	Rejected
		F	65.3	15.0	9.5	18.0	10.0	4.72	1.46	Accepted

6	I do a lot of mathematics exercises on my own and it help improve my performance	M	64.7	18.7	6.0	8.0	2.7	4.35	1.07	Accepted
		F	50.5	38.0	3.5	55.6	0.5	4.31	.89	Accepted
7	I study mathematics everyday I like my mathematics teacher and that makes me to like mathematics	M	78.7	17.3	2.7	0.7	0.7	4.73	.61	Accepted
		F	52.0	30.5	12.5	3.0	2.5	4.28	.93	Accepted
8	I like my mathematics teacher and that makes me to like mathematics	M	62.7	25.3	2.0	7.3	2.7	4.38	1.02	Accepted
		F	48.5	18.0	10.5	18.0	5.0	3.87	1.32	Accepted
9	I don't feel comfortable studying mathematics like I feel with other subjects.	M	26.0	14.7	20.7	14.7	24.0	3.04	1.52	Accepted
		F	19.0	9.0	25.5	34.0	22.0	2.50	1.20	Rejected
10	Being a girl or a boy interferes with my learning and my performance of mathematics	M	12.0	17.3	21.3	6.7	18.7	2.15	1.20	Rejected
		F	36.0	13.3	10.0	7.5	57.5	3.45	1.52	Accepted

From table 4.3 we can see that both male and female students accepted that learning mathematics help them to learn other subjects with male having the mean score of 4.47 and the females having the mean score of 4.10. It was rejected by male students that mathematics classes or lessons are not interesting with mean of 2.43 and accepted by females with mean of 4.47. Among the subject taught mathematics is my favorite subject; it was rejected by females with the mean of 2.39 while the males accepted that with mean of 4.15. Both of the genders get to be anxious whenever mathematics examinations are mentioned or brought with the males are having the mean of 4.11 while the females are having 3.72 as mean respectively. The male students rejected the fact that they only learn mathematics only because it is compulsory with the mean of 2.11 while it was accepted by females with mean of 4.72. All the students do a lot of mathematics exercise on their own and it improves their performance with male students having the mean of 4.35 while the female students have the mean of 4.31. The results revealed that both the male and female students study their mathematics everyday with the mean of 4.73 by males and 4.28 by females. It is also indicated that both of the genders likes their mathematics teachers which helps them to like mathematics with the male having the mean of 4.38 and the female mean of 3.87. The male students with mean of 3.04 feels comfortable studying mathematics while the female students don't with mean of 2.50. The male students also kicked against the motion that their gender interferes with their performance in mathematics with mean of 2.15 while the females agreed to that with mean of 3.45.

4.3 Research Question Two

What is the difference in the academic performance of Male and Female students in mathematics?

Table 4.3 Performance of males and females students

GENDER	0-5	6-10	11-15	16-20	TOTAL	N
REMARK	(%)	(%)	(%)	(%)	(%)	
Males	16.0	46.7	24.0	13.3	100	150
Females	16.5	56.0	18.5	9.0	100	200

Table 4.4 shows the performance distribution of males and females students. The result shows that 16.0% of the males' students scored within the range of 0-5 marks while 16.5% of the females scores within that same range also. 46.7% of the males' students scored within the mark of 6-10 marks while the 56.0% of the females' students scored within the same range of 6-11. 24.0% of the male students score within the range of 11-15 and 18.5% of the female students scored within that range. 13.3% of the male students scored within 16-20 while 9% of the female students scored within that same range of the scored.

4.4 Hypothesis one

There is significant difference in the attitude of students towards mathematics based on gender.

Table 4.4 Distribution Table for Chi-square Tests of males and females attitude to Mathematics

	Value	df	p-value
Pearson Chi-square	17.8839*	4	.15**
Likelihood Ratio	18.442	4	.001
Liner-by-Linear Association	.157	1	.692
N of valid cases	350		

P<.05

*2 cells (20.0%) have expected count less than 5. The minimum expected count is 2.

From table 4.5 we can see that the p-value is .15 which is greater than the 0.05 level of significance. Based on the result, the alternative hypothesis is accepted while the null hypothesis is rejected based on the fact that $p > 0.05$. This implies that, there is significant difference between males and females students attitude toward mathematics bases on this research.

4.5 Hypothesis two

There is no significant difference in the academic performance of students in mathematics based on gender.

Table 4.5 Distribution table of independent t-value for males and females students' performance in mathematics

Gender	N	Mean	SD	Std. Error Mean	Mean Diff	t-value	Df	2-tail significance
Males	150	2.35	.92	.08	.148	1.57	350	.191
Females	200	2.21	.83	.06				

The research hypothesis under investigation was whether there is a significance difference between males and females performance in mathematics. The t-test shows that there is a significant difference of performance based on gender as shown in table 4.6. Students t-test for equality of means showed significant difference in performance of males and females students ($t=1.57$, $p=.191$ at 95% confidence level). In these findings, boys performed better than females in mathematics.

4.6 Discussions of Finding

From the results of this research and the analysis and tests that had been carried out, it can be deduced that males and females students exhibit some attitude that are same for instance, both males and females students accepted that ,earning mathematics helps them in learning other subjects same time has some difference. Based on the test that was carried out, it was found that both have positive attitudes toward mathematics but the male students show more positive attitude to mathematics.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The primary aim of this research was to find the gender difference and attitude on the academic performance of students in mathematics in junior secondary school. From the data that was collected, analyze and interpreted and was followed by discussion, it can be deduced that male students shows more positive attitude in learning mathematics than their females pairs. The male students found with more positive attitude to mathematics. It was also found out that from the study that female students only study mathematics only because it compulsory which shows that if they will be given a choice they will prefer other subjects to mathematics.

This study also realized that the male students performed better in mathematics than the female students as the results of their attitude toward it.

5.2 Conclusion

The result of the study revealed that gender has an effect on mathematics performance of junior secondary school students in mathematics as well as their attitude towards it.

5.3 Recommendation

Based on the findings of this research, the researcher finally recommended as follows:

1. Mathematics teachers should carefully identify students with more positive attitudes towards learning mathematics and encourage them, while those with more negative attitudes should be guided appropriately.
2. In case where a student needs more counseling service as a result of extreme negative attitudes towards learning mathematics, he/she should be referred to a guidance and counseling master for such a service.
3. Parents at home should encourage their children to learn mathematics, pointing out on the needs to learn mathematics as well as the everyday application of mathematical concepts in solving real life problems.

4. Similarly, parents should give more courage to their daughters that they are capable of and can learn mathematics better than their male counterpart, and give them the necessary support they might require.
5. Government at all levels should try to equip schools with necessary teaching and learning materials. More qualified mathematics teachers should be employed and instructional materials for teachings/learning mathematics should be made available to all schools. This will help students develop more positive attitudes towards learning mathematics.
6. Mathematics clubs should be established in all secondary schools and mathematics laboratories should be constructed. This will facilitate easy access to mathematics equipment there by creating more interest among the students to learning it.
7. Students generally should develop more positive attitudes towards learning mathematics. This is due to the fact that mathematics is required in all levels of education.

REFERENCES

- Asante, K. (2010). *Sex Differences in Mathematics Performance among Senior High Students in Ghana*. <https://www.researchgate.net/publication/231598245>. DOI: 10.4314/gab.v8i2.61947.
- Bamora, F. (2010). *Gender Inequality in Education in Ghana*. The University of Hull- PhD Thesis.
- Bandura, A. (1977). Self Efficacy: Towards a Unifying Theory of Behavioural Change. *Psychological Review*, 84(2), 191.
- Bandura, A. (1999). *A Social Cognitive Theory of Personality*. In L. Pervin and O. John *Handbook of Personality*. New York: Guildford Publications: 154-196.
- Berends, M., Golding, E., Stein, M. and Cavens, X. (2012). Instructional Conditions in Charter Schools and Students' Mathematics Achievement Gains. *American Journal of Education*, 116(3), 303-335.
- Davadas, S.D. and Lay, Y.F. (2018). Factors Affecting Students' Attitude Towards Mathematics: A Structural Equation Modelling Approach. *EURASIA Journal of Mathematics, Science and Technology Education*, 14(1), 517-529.
- Hodges, C.B. and Kim, C. (2013). Improving College Students' Attitudes Towards Mathematics. *Tech Trends*, 57(4), 59-66.
- Kyei, L., Apam, B. and Nokoe, K.S. (2011). Some Gender Differences in Performance in Senior High Mathematics Examinations in Mixed High Schools. *American Journal of Social and Management Sciences*, 2(4), 348-355.
- Mahamood, S.F., Tapsir, R., Saat, A., Ahmad, S., Wahab, K.A., Boon, M.H.A. and Rahman, K.A. (2012). Parental Attitudes and Involvement in Children's Education: A Study on the Parental Aspiration Among Form Four Students in Selangor. *Procedia Social and Behavioural Sciences*, 42, 117-130.

- Marchis, I. (2011). Factors that Influence Secondary School Students' Attitude to Mathematics. *Procedia Social and Behavioural Science*, 29, 786-793.
- Mutai, C. (2016). *Gender Differences in Mathematics Performance Among Secondary School Students in Bureti Sub-County, Kericho County Kenya*. A Thesis Submitted to the School of Education in Partial Fulfillment of the Requirements for the Degree of Master of Education, Kenyatta University.
- Mutai, J. (2010). *Attitudes Towards Learning and Performance in Mathematics Among Students in Selected Secondary Schools in Bureti District, Kenya*. A thesis Submitted in Partial Fulfillment for the Award of Master Education Degree in the School of Education Kenyatta University.
- Mwiigi, J. (2014). *The Impact of Gender Differences on Student's Academic Performance in Secondary Schools in Ndumberi Division, Kiambu County, Kenya in Science Subjects and Languages*. A Research Project Submitted in Partial Fulfillment of the Requirement for the Award of the Postgraduate Diploma in Education of University of Nairobi.
- Nabavi, R. (2012). *Bandura's Social Learning Theory and Social Cognitive Learning Theory*. Retrieved from <https://www.researchgate.net/publications/267-750204>.
- Nnamani, S.C. and Oyibe, O.A. (2016). Gender and Academic Achievement of Secondary School Students in Social Studies in Abakaliki Urban of Ebonyi State. *British Journal of Education*, 4(8), 72-83.
- Organization for Economic Cooperation and Development. (2012). *Gender Equality in Education, Employment and Entrepreneurship*. Paris: Final Report to the MCM 2012, c/min (2012)5 OECD.
- Sakiz, G., Pape, S.J. and Hoy, A.W. (2012). Does Perceived Teacher Affective Support Matter for Middle School Students in Mathematics Classrooms? *Journal of School Psychology*, 50(2), 235-255.

- Schukajlow, S., Leiss, D., Pekrun, R., Blum, W., Muller, M. and Messner, R. (2012). Teaching Methods for Modelling Problems and Students' task Specific Enjoyment, Value, Interest and Self-Efficacy Expectations. *Educational Studies in Mathematics*, 79, 215-237.
- Tessema, T. (2010). *Classroom Instruction and Students' Attitudes Towards Mathematics*. Arizona State University.
- Umar, G., Yagana, W.S.B., Hajja, K.A. and Mohammed, W.B. (2015). Gender Difference in Students' Academic Performance in Colleges of Education in Borno State, Nigeria: Implications for Counselling. *Journal of Education and Practice*, 6(32), 107-144.
- United Nations Children's Education Fund (UNICEF). (2011). *Girls' Education*. Nigeria: Nigeria Country Programme.
- United Nations Department of Economic and Social Affairs (UNDESA). (2010). *Financing for Gender Equality and Empowerment of Women. Report of Expert Group Meeting Organized by Division for Advancement of Women and Hosted by the Government of Norway*. EGM/FFGE/2007/REPORT.
- Zacharia, L. (2014). *Factors Causing Gender Inequality in Education in Tanzania: A Case of Korogwe District Secondary Schools*. A Dissertation Submitted in Partial Fulfillment of The Requirements for the Degree of Master of Education in Administration, Planning and Policy Studies of the Open University of Tanzania.

APPENDIX A

Mathematics Students' Questionnaire (MSQ)

Dear respondent,

The purpose of this questionnaire is to find out the Gender Difference and Attitude on Academic Performance of Mathematics students.

Instructions: The information you give will be handled confidentially. Please respond to the items below as honestly as possible. Put a [√] in the brackets corresponding to your answer.

Section A: Students Bio-data

Gender: Male [] Female []

Section B: Gender Difference on Students Attitude

Instructions: This section has statements that you are to decide carefully whether you strongly agree (SA), Agree (A), Unsure (U), Disagree (D), or Strongly Disagree (SD). Put a tick [√] against each statement depending on your feelings. If you make a mistake, cross by putting (X) through the tick [√] and then tick in the appropriate box in the table below

S/N	Students' Attitudes.	SA	A	U	D	SD
1	Learning mathematics help me learn other subjects.					
2	Mathematics classes/lessons are not interesting					
3	Among the subjects taught, mathematics is my favourite					
4	I feel extremely anxious and fearful, when mathematics examinations are mentioned or brought					
5	I learn mathematics only because it is compulsory					

6	I do a lot of mathematics exercises on my own and it help improve my performance					
7	I study mathematics everyday					
8	I like my mathematics teacher and that makes me to like mathematics					
9	I don't feel comfortable studying mathematics like I feel with other subjects.					
10	Being a girl or a boy interferes with my learning and my performance of mathematics					

Appendix B

Mathematics Performance Test

Instruction: Circle the correct option in the following questions

- Convert 124 ten to a number in base eight.
(a) 046 eight (b) 241 eight (c) 174 eight (d) 114 eight
- Convert 1101 two to base ten
(a) 14 ten (b) 13 ten (c) 27 ten (d) 52 ten
- Express 0.3254 to 3 significant figures
(a) 0.324 (b) 0.325 (c) 0.3244 (d) 0.3331
- Express 34.694 in a standard form
(a) 3.4694×10^2 (b) 3.4694×10^{-1} (c) 3.4694×10^1 (d) 3.46×10^1
- A rope of length 15cm was measure by a girl to be 14.4cm. Find the percentage error
(a) 8% (b) 4% (c) 14% (d) 3 %
- Simplify $\sqrt{45}$
(a) $3\sqrt{2}$ (b) $3\sqrt{7}$ (c) $3\sqrt{5}$ (d) $5\sqrt{3}$
- Evaluate $2a^2 \times 4a^3$
(a) $8a^6$ (b) $2a^6$ (c) $8a^5$ (d) $2a^5$
- Solve the inequalities; $3y + 13 < 1$
(a) $y = 4$ (b) $y = -4$ (c) $y = 3$ (d) $y = -3$
- Factorize the expression; $xy - yz + 3y$
(a) $y(x - z + 3)$ (b) $x(y - yz + 3y)$ (c) $z(y + 3)$ (d) $y(x + z + 3)$
- All the following are plane shapes EXCEPT?
(a) Cube (b) Triangle (c) Rectangle (d) Square