

**UNIVERSITY OF EDUCATION, WINNEBA**

**PERCEPTION AMONG FEMALE JUNIOR HIGH SCHOOL PUPILS  
TOWARDS THE STUDY OF MATHEMATICS IN UPPER DENKYIRA  
WEST, GHANA**



**MARCUS KOBENA TAWIAH**

**POST GRADUATE DIPLOMA**

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**UNIVERSITY OF EDUCATION, WINNEBA**

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Faculty of Educational Studies submitted to the School of  
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**MAY, 2022**

## DECLARATION

### Student's Declaration

I, Marcus Kobena Tawiah, declare that this dissertation, with the exemption of quotations and references contained in published works that have all been identified and duly acknowledged, is entirely my original work, and it has not been submitted, either in part or whole for another degree elsewhere.

**Signature:** .....

**Date:** .....

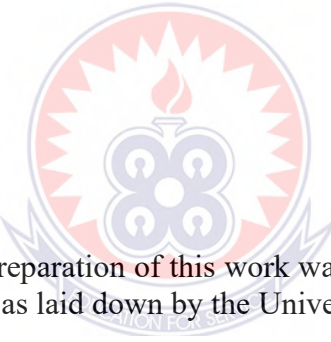
### Supervisor's Declaration

I hereby declare that the preparation of this work was supervised by the guidelines for supervision of this project as laid down by the University of Education, Winneba.

Dr. Daniel K. Buku (Supervisor)

**Signature:** .....

**Date:** .....



## DEDICATION

This project is dedicated to my wife Miss Dinah Afful, my daughter Maisie Benyiwa McBedu-Tawiah and my late sister Gladys Mena Esia Tawiah. May her soul rest in peace.



## ACKNOWLEDGEMENTS

My sincere gratitude goes to my supervisor, Dr. Daniel K. Buku for his assistance in the form of guidance and his time in reading through my project work and making the necessary correction.

To all you mentioned and unmentioned, I say thank you, and may the blessing of the Lord be your portion.



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## ABSTRACT

The purpose of the study was to find the perception among female Junior High School pupils towards the study of Mathematics in the Upper Denkyira West District in the Central Region of Ghana. A descriptive qualitative design was employed to explore the study. An interview session was used to provide data used for the study. The study involved 13 purposely selected female junior high school pupils in Nkronua D/A JHS in the Upper Denkyira West of Central Region. The data was in the form of recording through interviews were transcribed. The final output was presented in the form of texts and direct quotes from the respondents. The findings of the study showed that female junior high school pupils perceive mathematics as a difficult subject. Some of the factors that accounted for this were poor teaching methods, perception, and attitudes of mathematics teachers. The study also revealed that lack of parental support, lack of practice of concept taught, and lack of motivation were the major challenges female Junior High School pupils faced towards the study of mathematics. It was recommended that modern teaching and learning of mathematics be used to increase the interest of female Junior High School pupils in studying mathematics. It was also suggested that future researchers should extend their research to both male and female Junior High School pupils to help also find out some of the problems male pupils also face in mathematics.



## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background to the Study

Mathematics has become a vital subject because of its nature of solving real problems in our day-to-day activities, and Ghana as a nation cannot afford to be behind other nations in its development in this moment of global achievement (Nabi et al., 2016). Mathematics as a subject, in general, is important for both the scientific and technological development of every nation in the world. It is essential to our daily activities, and man cannot function without it (Nabi et al., 2016).

This means that no nation can improve upon its scientific and technological status to oversee its mathematics status, which indicates that mathematics is necessary for science. Asiedu-Addo and Yidana (2004) argue that mathematics is the act of emphasizing the minds of individuals in shaping their reasoning abilities and developing their personalities. Hence, it makes an immense contribution to the general and basic education of the people of the world at large (Asiedu-Addo & Yidana, 2004).

According to a study conducted by Bawuah (2013), there has been great concern about the performance of females as compared to males in the study of mathematics in the last decade. For instance, the figure for a female to male enrolment in the basic schools (basic 1–9) is represented by a ratio of 3:2 respectively, but it reverses when they move higher in the education levels due to the massive dropout of females for various reasons. These reasons may include poor academic performance, teenage pregnancies, examination malpractices, prostitution, and others. Female students require specialized knowledge to perform effectively in their future careers.

This will prove the attitude beyond doubt that mathematics education is essential for the development of a nation. A renowned Ghanaian educationalist, Dr. Kwegyire Aggrey, once made a statement that said, "If you educate a man, you educate a single person, but if you educate a woman, you educate a whole nation." The Chief Examiner's reports (2018- 2019) for the BECE for the past years indicated that female performances in mathematics were below average.

Poor performance in the area of mathematics among pupils has been a big challenge for most teachers in Ghanaian basic schools, especially in the Upper Denkyira West district. Policymakers, the Ghana Education Service, and other stakeholders in education have all expressed a great deal of concern about the nature of poor performance in mathematics nationwide. A well-balanced mathematical program that will include the concepts of learning and development, maintenance, and the application of skills acquired by teachers should be taught in such a way that it will develop pupils' endowments to think and reason mathematically (Young, 2011). Mathematics is one subject that has been given greater attention in the curriculum of our various educational systems. Mathematicians and educators have shown concern about the teaching and learning of mathematics in both basic and senior high schools since mathematics is compulsory for all students in many countries, from primary to secondary levels (Lawson, 2003).

In many countries, including Ghana as a nation, mathematics has the highest number of hours per week for instructions Curriculum Research and Development Division (CRDD, 2007). This is because sufficient knowledge of mathematics equips pupils to fit into the various scientific and technological fields well in the modern world. In most situations, mathematics is regarded as the foundation and tool for basic sciences

and, an appropriate method for measuring the academic performance of pupils. New areas in which mathematics can be used profitably are being discovered in many human lives. It has been proven for the understanding and first-hand technological control of the physical world and the social structure.

Mathematics is a subject whose concepts, skills, and relationships have applications in every field of study; technology, science, geography, economics, and other human endeavors; mathematics teachers are challenged to use innovative teaching skills and methods capable of developing pupils' understanding, problem-solving skills, and interest (Parson et al., 2007). Most changes in the structure and context of mathematics curricula come as a result of the changing needs of citizens for efficient participation in the increasingly technological world and the increased volume of research knowledge about teaching and learning (Clark, 2009).

In Ghana, the 2012 educational reform was based on the need for an educational system that would serve the needs of the individual, society, and the country as a whole (MOE, 2012). To meet the needs of the individual in a changing scientific world, mathematics should not be treated as a fixed collection of facts and procedures (Anderson, 2007). Hence, it should be treated as a dynamic body of knowledge that is continually enriched by exploration, analysis, generalizing, and conjecturing (Forman, 2003). In this, moving from the classroom, where memory facts and algorithm practice are emphasized, to that, a classroom of solving problems, critical thinking, and understanding are emphasized.

Ghana has a long way to go in terms of attaining gender equality in science, technology, and mathematics education, as these fields have traditionally been dominated by male counter professionals. Mathematics and science are seen as a

man's domain and an "abstract black box" that can only be handled by exceptionally gifted people (Allotey, 2012). Ghana requires highly competent female math educators, mathematicians, scientists, doctors, and other scientific workers (Allotey, 2012).

Studies have revealed that many female scientists, mathematicians, doctors, and statisticians in Ghana are fewer than their male counterparts. Lack of motivation, inadequate teaching, and learning materials, lack of parental support, mathematics anxiety, poor teaching methods by some teachers, curriculum nature are the factors that create a perception among female junior high school pupils to perceive mathematics as a difficult subject and discourages them from pursuing mathematics and science-related courses (Asante, 2010; Allotey, 2012).

Another strong reason to study mathematics according to Salifu (2017) is that its concepts, models, and procedures are at the heart of economic expertise, including in banking, economics, agriculture, and the information and communication technology industries. Female students' ongoing negative attitudes and perceptions toward mathematics studies may worsen gender gaps in the country's mathematics and science fields. It may also lead to a perpetuation of poverty among women, as they may lack the necessary scientific and critical thinking skills to create and manage resources for the socio-economic growth of their families, communities, and the country as a whole (Salifu, 2017).

If there is a need for true understanding and as a result of the transfer of learning into new situations, pupils need to get to the point where they can formulate mathematical concepts for themselves. For pupils to go through a series of learning procedures to provide the right solution to problems, especially in the case of females in the country,

is not feasible (Li & Schoenfeld, 2019). The discipline of mathematics is distinguished from other teaching subjects by the fact that it appears to enrich a broader range of situations than other teaching subjects (Mapolelo & Akinsola, 2015). Some associations, locally and internationally, have been involved in various tasks for the improvement of mathematical instructions at all levels (Long, 2003). The Mathematical Association of Ghana, for example, organizes a regular annual workshop to educate mathematics teachers on the importance of mathematics in the country's development and also improves the teaching and learning process in the country. Mathematics teachers should also inform students, pupils, and the general public about careers in mathematics as a subject. Mathematics has now been applied in the areas of economics, history, political science, sociology, medical research, business management, and many more.

The need for the use of advanced mathematics is even higher for students interested in research into the spread of diseases and growth of cells in biology and population data handling (Wang, 2004). Programming necessitates a great deal of mathematical understanding. Problems are solved systematically by the coder. The programmer uses machine language to transform the problem into computer-readable instructions. All systematic methods require a good mathematical background.

Furthermore, electricians, agriculturalists, statisticians, accountants, and other professionals who have some mathematical tools or knowledge are interested in the relationship between data input and output. The use of a computer at a young age may help acquire the computer skills and concepts that have mathematics as their background. Mathematics should be taken with all seriousness at the primary, junior high, and senior high levels to help sharpen the skills and abilities of pupils to

understand the use of computers (Bekpe, 2012). National, regional, and district planning officers use mathematics in their day-to-day activities (Lewin & Stuart, 2003). The proportional distribution of facilities to communities is made easier by the use of mathematical applications. The demarcation of social amenities such as schools, hospitals, road systems, and electricity is equally shared by the use of the knowledge acquired through mathematics (Osafo-Affum, 2003). With all of this, it is clear that humanity cannot function without mathematics in our daily lives.

## **1.2 Theoretical Framework**

Many variables contribute to gender differences in mathematics, including biological factors, teacher attitudes, student attitudes, teacher training, social-cultural influences, and myths and beliefs that Mathematics is only for boys. All of these aspects should be investigated to find a solution and improve the performance of the females. The study is based on the socialization theory (Eccles, 2005), which asserts that there is a gender disparity in math achievements and attitudes. The expectancy-value model (Frome & Eccles, 2007) supports this hypothesis, explaining why cultural imbalances in educational or employment prospects hurt girls' and women's careers. This aids the existing research on students' attitudes toward the subject and their perceived career paths.

Similarly, according to psychological theory (Bussey & Bandura, 2009), girls are aware of the activities that women in their culture engage in. Consequently, they feel empowered to emulate and imitate those behaviors. As a result, women adopt gendered educational and career choices that mirror societal gender stratification. Mathematics is a subject that appears to be more masculine, and as a result, girls may

be uninterested in it because there are no women in mathematics-related occupations in their community.

### **1.3 Statement of the Problem**

Many educationalists have realized the recent challenges of early mathematics education and have now paid crucial attention to early mathematical research. Despite the many advantages of studying mathematics, it was stated that there is a national aversion to mathematics in Ghana and that math phobia has permeated all rungs of the education ladder (Fredua-Kwarteng & Ahia, 2004).

For all the efforts and reforms that have been introduced at the various levels (basic, junior high schools, and senior high schools) in mathematics from 1995 up to date, there has been little improvement in the achievement of rural school pupils in mathematics West Africa Examination Council (Waec, 2017). There is a tendency for some stakeholders to blame mathematics teachers in rural schools for poor performance (Kofowa, 2012). Although pupils' performance in mathematics is going down, it turns out that male pupils perform better than their female counterparts.

A procedure of inquiring was undertaken to dive into the situation to find out the causes of the poor performance of females in mathematics in the Central Region. It turns out that most female pupils in other districts within the Central Region perform better than those in the Upper Denkyira West district. As a result of this development, most female pupils in the Upper Denkyira West district do not get admission into their first-choice senior high school.

Also, it was noticed that most female pupils in the district shy away from mathematically related courses at the secondary and tertiary levels of education due to



their poor background in mathematics (Bawuah 2013). It is in line with this development that this research sought to investigate the situation to find out the factors that contribute to the poor performance of female pupils in the Upper Denkyira West schools in mathematics.

#### **1.4 Purpose of the study**

This study aimed to explore the perception among female junior high school pupils towards the study of mathematics in the Upper Denkyira West District in the Central Region of Ghana.

#### **1.5 Objectives of the study**

The specific objectives were to:

1. Find out factors that make mathematics a difficult subject for female pupils.
2. Find out the challenge female Junior High School pupils face in learning mathematics.
3. Outline the ways of overcoming these challenges female junior high school pupils faced in learning mathematics.

#### **1.6 Research Questions**

1. Why do female Junior High School pupils perceive mathematics as a difficult subject?
2. What challenges do female Junior High School pupils face towards learning mathematics?
3. How do female Junior High School pupils attempt to overcome the challenges faced towards learning mathematics?

### **1.7 Significance of the Study**

The study would provide the opportunity to direct, maintain and develop the interest of female pupils towards the study of mathematics at the basic level.

Again, the study would provide information for parents, mathematics teachers, headteachers, educational stakeholders, and the public at larger about the poor academic achievement in mathematics concerning female pupils. The findings could be used by mathematics teachers and headteachers to improve the classroom mathematics lessons delivery and administration work. Ghana education service and curriculum designers could fall on the findings as a guide in designing the junior high school mathematics syllabus as well as a teaching guide to help support female pupils in the rural areas.

This research would also propose some ways of helping solve this problem once it is thoroughly investigated. This would enable many more women to pursue careers in mathematics-related fields such as economics, statistics, and engineering.

### **1.8 Delimitation of the Study**

The study was delimited to the perception among female junior high school pupils towards the study of mathematics in some rural schools in Upper Denkyira West district in Central Region, Ghana. It focuses on the attitudes and behaviors exhibited by female junior high school pupils when it comes to mathematics lessons in the class and the challenges it brings to them. The study would be focused on the female junior high school in the Nkronua D/A Basic School in the Upper Denkyira West district.

### **1.9 Limitation of the Study**

The limitation of the study is mainly a function of the instrument used in acquiring data and generalizing the outcome of the study. The study would implore the use of a semi-structured interview guide to acquire information from the respondents. The findings may be influenced by the respondents since they are given further notice. Perceptions and attitudes can be influenced daily and a bad experience on the day of the interview could skew the pupils' response to the survey. Again, the study is limited to female junior high school pupils at Nkronua D/A Basic School in the Upper Denkyira West hence, the findings cannot be generalized to other settings or contexts.

### **1.10 Definition of Terms**

**Syllabus:** is a standards-based set of structured experiences, students practice and gain competency in the topic and applied learning skills.

**Perception:** refers to one's ideas, feelings, and knowledge about one's aptitude, abilities, attractiveness, and social acceptability.

**Anxiety:** is referred to as an unpleasant feeling of fear or worry about something that is happening or might happen.

**Mathematics anxiety:** is a feeling of tension, worry, or anxiety that affects one's ability to perform well in math.

### **1.11 Abbreviations**

BECE – Basic Education Certificate Examination

CRDD – Curriculum Research and Development Division

WAEC – West Africa Examination Council

MOE – Ministry of Education

D/A – District Assembly

### **1.12 Organization of the Study**

The study was made up of five chapters. Chapter one comprised of the background to the study, theoretical framework, statement of the study, the purpose of the study, research questions, significance of the study, delimitation of the study, limitation of the study, definition of terms, abbreviation and organization of the study. Chapter two dealt with the literature review of the study. Chapter three also dealt with the methodology. Chapter four dealt with the findings and discussions of the study and chapter five contained the summary, recommendation, suggestion, and conclusion of the study.



## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

This chapter deals with the literature review of the study. For clarification and simplification, the study has been treated and streamlined on the following subheading:

1. Perception among students
2. Attitude and perception of mathematics among students
3. Curriculum in mathematics
4. Methodology of instruction
5. The student's arithmetic ability
6. A fear of mathematics
7. The mathematical performance of girls over time
8. Gender disparities in math achievement.
9. Changing pupils' attitudes toward mathematics
10. Summary

#### 2.1 Perception among Students

The process through which organisms interpret and organize sensations to form a meaningful sense of the world is known as perception. To put it another way, a person is faced with a circumstance or stimulus. Based on earlier experiences, the person interprets the inputs into something significant to him or her. However, what a person thinks or perceives may differ significantly from reality. Attitude and perception are inextricably linked (Amponsah, 2019).

The most crucial factor is how individuals see items or people concerning what they believe they are or should be (Morris, 2008). The way students perceive mathematics is determined by what they perceive mathematics to be about. Because students are selective in what they see as relevant to them. Perception leads to actions and attitudes, which are in turn influenced by the individual's attitudes. Individual differences in self-perception have been linked to academic success in various studies (Spinath, 2006). The perception that students have of themselves is referred to as their self-concept (Ahmavaara & Houston, 2007).

It encompasses beliefs, sentiments, and information regarding one's abilities, skills, attractiveness, and social acceptability (Bouche & Harter, 2005). They also argued that these self-perceptions are mostly developed as a result of one's interactions with and interpretations of one's surroundings. They proposed that self-concept is a construct that grows in complexity as an individual grows from childhood to adulthood. Ahmavaara and Houston discovered that as children grow, their self-concept gets more distinct, and they proposed that as they grow, there will be an increasing number of self-concept domains that can be enunciated and differentiated.

According to Ahmavaara and Houston (2007), as children reach puberty, they demonstrate an increase in their ability to make self-worth assessments, and as adolescents, they further articulate their thoughts regarding self-esteem. When it comes to academic performance, culture or ethnicity can be an important part of self-concept. Self-concept has a substantial impact on study results, according to studies in most European and Western cultures (Bouche & Harter, 2005; Spinath, 2006). Researchers studying self-concept have discovered a link between how pupils perceive themselves and their academic achievement (Harlaar, & Robert, 2006). This

demonstrates the importance of students' judgments of their self-concept and academic difficulties in determining learning outcomes. The literature on self-concept supports the idea that how people see themselves has an impact on their lives at all times. Woodward (2004) shows that pupils' mathematical perceptions and anxieties have been proven to affect pupils from all socioeconomic and educational backgrounds.

As the world moves at a breakneck pace, humans have access to more information than ever before, from computers and calculators to daily mental calculations. It is critical for pupils to become proficient in maths. To succeed in a variety of daily commercial and workplace contexts, learners must not only deal with a wide range of operational abilities such as computing decimals, percentages, fractions, and algebra, but they must also understand underlying numerical principles. Students must develop self-efficacy, feel confident about themselves, and understand that they are responsible for their actions at some point to deal effectively with these challenges (Bawuah, 2013). Unfortunately, most pupils lack confidence in their ability to answer mathematical problems. Learners at all levels of education are regarded as having a negative attitude toward discipline (Tapia, 2004). A student's confidence in his or her competence is generally viewed as a significant component in the learning and teaching process. In the educational setting, it is recognized that a lack of confidence may inhibit a learner from putting forth the necessary effort to achieve the educational procedures' objectives.

According to Reid and Yang (2009), confidence is one aspect of self-concept that has to do with a student's belief in his or her capacity to acquire new math and perform well on math assignments. They suggest that a student's confidence affects his or her

motivation to tackle new topics and persevere when the content becomes difficult. Another point put out by Oraif (2007) is that confidence is an attitude or perception of oneself that is highly influenced by experience. When secondary and elementary school students faced a new and open-ended task, Yang and Reid (2009) found that confidence was low, but that after completing the first task, such task confidence increased significantly when students faced subsequent tasks, even when they were having difficulty with the task. They also discovered that while increased confidence did not appear to lead to higher performance in open-ended tasks, it did indicate that the student approached future tasks with greater enthusiasm and self-assurance.

Many students have been studied to see how confidence in mathematical ability affects performance and participation (Planas & Civil, 2008; Evans, 2005), and there was a significant association between confidence in mathematics ability and mathematics achievement (Planas & Civil, 2008). Evans looked into attitudinal and motivational characteristics associated with mathematics achievement in grade eight students in Jordan. According to one of his key findings in this study, confidence was more strongly connected with mathematical achievement than any other attribute.

The question is how learners' confidence can be built, as well as how these skills can be improved and applied to people. The main factor is that achievement appears to boost confidence among students who have performed well on exams (Oraif, 2007). The key question is how to help folks who aren't great at formal exams, especially ones who are reliant on the memory of facts or procedures succeed. If success is purely dependent on confidence, there is a serious risk that the examination system may produce a large number of failing pupils, lowering their confidence.



This could lead to even worse exam results; as a result, the system could cause a loss of confidence. People who have a negative opinion of mathematics have low self-esteem and a sense of ineptitude (Schoenfeld, 2016). These attitudes are manifested in self-deprecating statements and a persistent lack of mathematical success. In the realms of achievement and self-evaluation of one's talents, one's self-concept is an important factor to consider. Pezdek, Berry, and Renn (2007) discovered that basic mathematics teachers' attitudes can be conveyed to their pupils since students' statements regarding their previous mathematics professors are substantially related to their impression of mathematics. As a result, if teachers have a favorable attitude or perception of mathematics, these beliefs may help to equip their global self-concept while also benefiting and altering the lives of these elementary pupils who are studying mathematics.

Improving undergraduate and graduate students' attitudes toward mathematics is a critical concern for university education programs, and this will help future elementary students have favorable attitudes toward mathematics.

## **2.2 Attitudes and Perceptions of Mathematics among Students**

Ma and Xu (2004) researched how students respond to various mathematics activities and topics. They discovered that both elementary and secondary students value mathematics (Cooper, 2007). They also discovered that social differences in mathematics participation were linked to different perceptions and attitudes toward mathematics study. Tricia (2004) reported that 52 percent of males love working in the scientific profession, while 29 percent of females enjoy science-related job options.

Apart from the fact that 50% of boys and 33% of girls in primary school said they were competent in arithmetic Hanmer (as cited in Tricia, 2004). Another survey indicated that kids in Glasgow's primary schools deemed mathematics to be one of the most popular subjects (Alhmali, 2007). Hannula (2005) found that considerably more pupils detest mathematics as they go from junior high to college. This series may be related to the commencement of students' career choices as they progress from secondary school to college.

### **2.3 Mathematics Curriculum**

The existing mathematics curricula have sparked a lot of debate in the literature. The process of calculation or computation solely includes the deployment of a set procedure with no room for imagination or flare, no area for guesswork or surprise, no potential for discovery, and no need for the human being, in reality (Das, 2019) claimed. The issue here is not that children should never learn to compute, but rather that they should learn to critically assess mathematical problems and come up with effective answers. This necessitates them to learn how to make sense of difficult math topics and how to reason mathematically (Mulwa, 2015).

Many mathematics programs emphasize memorization of facts while neglecting to stress understanding and application of this knowledge to find, link, and test mathematical concepts. For students to successfully apply what they learn, they must move beyond memorization to conceptualization, application, and problem-solving. According to studies, a curriculum that assumes pupils are incapable of meta-cognitive actions (e.g., complicated reasoning) should be replaced by one that regards pupils as capable of higher-order thinking and reasoning when they are provided with the appropriate and relevant knowledge and activities (Schoenfeld, 2016).

According to research, curricula in which students' knowledge and abilities increase are significantly linked to their learning and, as a result, their achievement (Moradi & Amiripour, 2017). The goal of the study was to see if and how the curriculum influences the girls' attitudes toward mathematics, as well as the extent to which it changes their view of the subject.

## **2.4 Methodology of Instruction**

Making one's existing state of knowledge, building on it, improving it, and making changes or decisions in the face of conflicts are all necessary skills for success in mathematics. This necessitates problem-solving, abstracting, innovating, and proving (Das, 2019). These are basic cognitive operations that students must master to succeed in mathematics classes. As a result, instructional strategies and approaches that present a student with learning contexts in which they can acquire and apply higher-order processes are crucial for success in mathematics. According to the study by Wilson (2010), teachers should provide relevant and realistic learning experiences for students to develop their understanding and knowledge of this topic domain.

Furthermore, it is underlined those instructional practices that encourage students to actively participate in their learning are crucial for success (Mupa & Chinooneka, 2015). The growth of students' learning and achievement is influenced by instructional tactics.

## **2.5 The Student's Arithmetic Ability**

Another predictor of mathematics achievement could be arithmetic competence. Arithmetic ability includes abilities such as using mathematical information and concepts to change their meaning and implications. It enables pupils to comprehend, analyze, synthesize, generalize, and hypothesize about mathematical facts and

concepts. Solving complex issues, discovering new meanings and understanding, and arriving at logical conclusions are all tasks that students with strong arithmetic aptitude or mathematical reasoning can participate in.

Various studies have identified arithmetic competence as a key element in pupils' math achievement. For example, arithmetic ability had the strongest association coefficient with mathematics achievement in a study by Mazana, Montero, and Casmir (2019). Similarly, Arhin and Offoe (2015) discovered that a level of ability was the strongest predictor of student accomplishment. Other scholars have looked into the impact of gender issues and arithmetic skills on math accomplishment. Poku (2019), for example, investigated longitudinal data obtained over ten years to see if personality factors were associated with gender disparities in long-term achievement in mathematics and the sciences. In the study, mathematics skills were found to be the most important predictor of long-term accomplishment in mathematics for young women. On the other hand, the level of mathematics ability did not appear to play a role in young men's long-term mathematics achievement.

## **2.6 Anxiety in Mathematics**

According to the Cambridge International Dictionary of English, anxiety is unpleasant sense of apprehension or worry about something that is happening or might happen. Mathematical anxiety is defined as an uncomfortable feeling of nervousness or worry about mathematics, according to the definition. In other words, mathematical anxiety is concern about one's inability to perform arithmetic, regardless of talent. When it comes to children's arithmetic problems, mathematics anxiety is a common topic of discussion. It's also known as Mathematics Phobia (Richardson & Suinn, 2016). Richardson (2021). defines mathematical anxiety as "a sensation of tension, stress, or

fear that interferes with mathematics performance." Richardson and Suinn (2016) developed the first mathematics anxiety measure. Other researchers have since undertaken empirical studies into maths anxiety. Sawhill (2022) conducted a thorough meta-analysis of 151 studies on arithmetic anxiety.

Mathematics anxiety, according to Tsanwani (2009), is an irrational and impedimental fear of mathematics. This term describes the fear, powerlessness, mental paralysis, and disarray that some people feel when presented with a mathematical problem. Mathematics anxiety, according to the literature, is characterized as a person's worry and anxiety that prevents them from manipulating numbers and solving mathematical problems in a variety of everyday and academic settings (Khatoon & Mahmood, 2010). It's also feasible to conclude that the discomfort felt while working on mathematical problems is tied to dread and trepidation in certain mathematics-related situations and that it's a universal emotion (Mahmood & Khatoon, 2010).

## **2.7 The Mathematical Performance of Girls Overtime**

While there is limited evidence on the other components examined in this study, many studies have identified slight but consistent gender disparities in learners' attribution patterns for their mathematics ability. Boys ascribe their success in mathematics to more stable elements, such as problem difficulty or ability, whereas girls attribute their success to more unstable ones, such as effort, luck, and a good instructor (Anjum, 2015).

Assouline et al. (2008) investigated variations in top attributional choices for success and failure in general academics, language arts, science, and mathematics among high-achieving males and females. Failure is blamed on effort rather than ability in gifted children. Significant gender differences were shown in boys' and girls'

performance attribution patterns. Research by Lloyd et al. (2005) found that girls' mathematics achievement was equal to or better than boys', and girls' attribution patterns were more self-enhancing than those of other studies considered for the study. Girls, on the other hand, were shown to have low self-esteem about their actual mathematics achievement and were more prone than males to blame their failure on a lack of instructor assistance.

## **2.8 Gender Disparities in Mathematics Achievement**

There have been significant advancements in female students' college preparedness over the last 60 years, and the college gender gap has narrowed substantially. According to Goldin et al. (2006), female high school students currently surpass male students in most courses, particularly in verbal test scores. The ratio of male to female college graduates has not only been reduced but has also reversed, with females now accounting for the majority of college graduates. The gender divide in mathematics has shifted as well. The number of female high school students taking mathematics and science courses has increased, and today the mean and standard deviation of performance on mathematics exam scores are only marginally higher for males than for females. Muriel and Vesterlund (2010) show that many more boys than girls perform in the positive tail of the normal distribution curve, despite slight differences in mean performance. This gender divide has existed for a long time.

This gender gap has been documented in several mathematics tests, including the calculus test, the Mathematics SAT, and the quantitative portion of the Graduate Record Exam (GRE). Over the last two decades, the ratio of males to females scoring in the top five percent in high school mathematics has remained constant at two to one (Xie & Shauman, 2003). Ellison and Swanson (2018) discovered a two-to-one male-

female ratio when they examined students who scored 800 on the Mathematics SAT in 2007. Substantial research (Wambui, 2018) has attempted to explain why boys outperform girls in mathematics. The question is why do girls and boys differ in their likelihood of excelling in mathematics? One argument is that boys have and develop superior spatial skills, which gives them an advantage in mathematics. This disparity may have an evolutionary basis, as male tasks such as hunting may have required more spatial orientation than typical female tasks (Gaulin & Hoffman, 2016).

Furthermore, it could be because boys engage in more movement-oriented play and thus grow up in more spatially complex environments (Berenbaum et al., 2010). There is evidence of a significant and substantial gender difference in the extent to which skills are reflected in competitive performance Gneezy, Niederle, and Rustichini (2013). In mixed-sex situations, the impacts range from women failing to do effectively in competitions to women avoiding environments where they must compete (Niederle & Vesterlund, 2007). Men and women react differently to competition, and gender differences in competitive performance do not reflect differences in non-competitive performance in the same setting.

Hormones and prenatal brain differentiation, stereotype threat, and other factors have all been presented as explanations (Halpern et al., 2007). Wambui (2018) offered a sociological theory that suggested that societal gender stratification is the cause of females' lower mathematics achievement and more negative mathematics attitudes. According to the gender stratification hypothesis, in patriarchal civilizations, male pupils are disadvantaged. They connect their accomplishments to future changes and results. Girls do not perceive such a link as a result of the fewer options available to females, and so they do not achieve as well as boys in sectors that they believe to be

less useful. Wambui (2018) stated that female students who are given fewer opportunities may perceive mathematics as less important for their future and are taught as such by instructors, parents, and friends in a variety of ways. In short, opportunity structures can affect a variety of socialization processes that influence performance.

In general, the gender stratification hypothesis states that where there is more societal stratification based on gender, and thus more inequality of opportunity, girls will have fewer positive attitudes and negative affect, and will perform worse on mathematics achievement tests than their male counterparts. However, if there is greater gender equality, there will be more gender similarities in mathematics (Wambui, 2018).

## **2.9 Changing Pupils' Attitudes toward Mathematics**

Pre-service teachers' areas of specialty appear to be influenced by their dislike of mathematics (Swars, 2006). Around 90% of pre-service teachers in Florida, the United States, choose to specialize in subjects other than mathematics (Davies & Florian, 2004). Then one would agree that behavioral difficulties must be addressed before pre-service teachers are expected to study, participate fully, and comprehend mathematics. As a result of conversations between mathematics and education faculty, a pedagogical strategy—an integrated, collaborative, field-based approach to teaching and learning mathematics has arisen (Grootenboer & Lowrie, 2004).

The purpose of the approach is to improve pre-service teachers' mathematical understanding by changing their attitudes and perceptions of mathematics (Grootenboer & Lowrie, 2004). It is believed that having high confidence in their ability to do math will lead to a good perception and, as a result, a boost in motivation. Students' mathematics knowledge will also improve as a result of this



(Southwell & Penglase, 2005). Pre-service instructors with more topic understanding and confidence will graduate students with a favorable attitude toward and view of mathematics in the long run (Evans, 2009). When youngsters are given a little push in the form of motivation, encouragement, or support to learn mathematics, they acquire strong self-confidence in their capacity to perform well.

Teachers can assist students to study mathematics better and thus enhance their performance in the subject by doing a variety of things, including establishing positive attitudes about the subject (Silver, Mesa, Morris, Star & Benkem, 2009).

## **2.10 Chapter Summary**

The goal of this study was to explore how female junior high school pupils see mathematics in Upper Denkyira West, as well as to identify the issues surrounding mathematics in the district's many schools. The study focuses on female junior high school pupils' attitudes towards mathematics and how they influence their attitudes and performance in mathematics. The review looked at the students' perception of mathematics and how they affected their attitude and performance in mathematics. It also looked at the concept of mathematics as a subject. The review again looked at the nature of the curriculum of mathematics and the methodology of instruction by teachers in the district.

Finally, the review looked at the fear of mathematics of pupils, gender disparity in mathematics, and changing pupils' attitudes towards mathematics. The next chapter will look at the methodology aspect of the research which explains how the study will be carried out.

## CHAPTER THREE

### METHODOLOGY

#### 3.0 Introduction

This chapter focused much on the methodology for the study. It deals with the research design, area of study, population, sample and sample procedures, instrumentation, data collection procedures, and method of data analysis.

#### 3.1 Research Design

This study used a case study design, and a descriptive qualitative research design has been used to achieve the purposes of the analysis. A research design can be regarded as an arrangement of conditions for collection in a manner that aims at combining relevance with the purpose of research (Kombo & Tromp, 2006).

Descriptive qualitative research design and case study assisted the researcher in gathering accurate data with regards to the perception among female junior high school students towards the study of mathematics. The qualitative design was chosen to outline the perceptions among female junior high school students towards the study of mathematics Baxter and Jack (2008). The design was used for the following reasons.

Firstly, it is a broad strategy of choice when the researcher has a direct interest in a particular situation. It is often employed as a direct consequence of the researcher's interest in a particular case (Ebenyamini & Moghadam 2018).

The second is also linked to the first, which is the interest in a particular case from within the context of the case itself. The use of case studies shows an emic approach. This case study was the ideal strategy to employ when the study demanded the

phenomenon (i.e., the perception among female junior high school pupils towards the study of mathematics) be studied. The design appropriate for this study should fall within the parameters to take care of the study, and a case study design was found appropriate for the study.

The nature of the phenomenon and the study influenced the choice of the case study design. The case study design is the most appropriate when the researcher seeks to answer questions of the "how and why" nature, as contrasted with those that focus on the incidence or frequency of particular events (Yin, 2003). He also explains that case study design is the best way to study the effects of contemporary events.

Yazan (2015) made the same point that case study design should be "particularistic", that is to say, they must focus on a specific program, phenomenon, or event. For that matter, the case study design is essential for solving practical situations. The research aimed at the perception among female junior high school pupils towards the study of mathematics. Lastly, the case study design was found to be the most appropriate for the study because it allows a degree of flexibility within the work (Manca et al., 2018)

### **3.2 Area of Study**

The research was carried out in the Upper Denkyira West District in the Central Region of Ghana. Specifically, at the Nkronua D/A Basic School in the Nkronua Anafo village. It's a farming community with a lot of gold minerals in the ground. This result has drawn a diverse group of people from many tribes and social classes in Ghana. A total of 1,531 people, 764 males, and 767 females make up the population per the 2010 population and housing census. Due to the farming and mining activities in the community, females spent their time assisting parents on the farm while others

go the mining sites in the search of money to help cater to their well-being. This makes these females perform below average in mathematics in class.

### **3.3 Population**

Members of the study's targeted demographic are referred to as the "population." According to Gonu, and Agyapong (2016), the population is the collection of cases that satisfy a set of characteristics. Hence the aim of this study is the targeted population includes all junior high school pupils in the Upper Denkyira West District in the Central Region, Ghana. However, the accessible population consists of 13 female junior high school 1, 2, and 3 pupils in the Nkronua D/A JHS in the Upper Denkyira West district.

The junior high school pupils were selected because they can give a better description of their perception of female junior high school towards the study of mathematics. They were considered since they are all potential candidates and have a fair idea about the BECE.

### **3.4 Sample and Sampling Procedure**

A sample is a smaller number or population used to conclude the population as a whole. It is aimed at estimating unknown population characteristics. A sample of 13 female junior high school pupils were selected for the study. These students are made up of three, four, and six female junior high school students in junior high school one, two, and three, respectively. According to Cooper (2007), a range of 2 to 10 participants is an adequate number to reach saturation of a study that is qualitative. These pupils were not chosen to produce data that could be used to generalize a larger population, but they were selected on the premise that they would produce rich information on the phenomena and the issues essential to the purpose of the study.

Purposive sampling is widely used in qualitative research for the identification and selection of information-rich cases for the most effective use of limited resources (Patton, 2015).

This study used purposive sampling techniques to select a sample. This situation arises when it is impossible to obtain a list of all members of an accessible population. In the view of Kumekpor (2004), purposive sampling is a method of selecting the units not through random procedures, but by intentionally picking or choosing them for the study applied. Purposive sampling was used based on the advantages that enable the researcher to use their knowledge and skills of the subject to select respondents with adequate knowledge of the phenomenon under study. In addition to knowledge and experience, Palinkas et al., (2011) note the importance of availability and willingness to participate and the ability to communicate experiences and opinions in an articulate, expressive, and reflective manner

### **3.5 Data Collection Instrument**

The study relied on a primary source of data. The primary data comprised information collected from respondents through Semi-structured interviews. The semi-structured interview was granted to 13 pupils of Nkronua D/A Junior High School in Denkyira West District. The semi-structured interview guide was used for the collection of the data for the study. Magaldi and Berler (2020) indicate that semi-structured interviews as “semi-standardized”. They argued that in such an interview the interviewer asked the same major questions in the same fashion each interview but the process incorporates greater flexibility than the structured interview. This instrument was also seen as appropriate for the study as it enables the researcher to achieve objectivity while simultaneously creating a situation where the respondents can clearly articulate

their perspectives. The interview guide was designed to elicit responses from the respondents. The semi-structured instrument focused on the perception among female junior high school pupils towards the study of mathematics.

### **3.6 Interview Schedule**

Data were obtained by use of an interview schedule, which was developed to meet the specific objectives of this study. An interview is a situation during which, a researcher or interviewer tries to obtain certain information from knowledge and experience or an expression of opinion (Onyango & Plew, 2015). The interview schedule contained both open-ended and closed-ended questions. The open-ended questions were reasonably objective while allowing a thorough understanding of the respondent's opinions and reasons behind them (Omona, 2013).

The interview schedule was chosen because it permits personal contact with the respondents. This has the advantage of drawing out the respondent by allowing on-the-spot follow-up questions and it allows the interviewee to give information and develop rapport with the respondent. Interviews allow more complex and detailed questions to be asked. They also facilitate the collection of more in-depth information. Interviews minimize misinterpretations and inconsistencies since these are easily checked by the interviewer.

### **3.7 Pre - Testing**

According to Coolican (2014), pilot trials are used to test research or interview a small group of people to uncover flaws or errors in the design or to improve usable measurement devices. According to Mugenda and Mugenda (2003), subjects from the real study should not be included in the pre-test. The interview was tested on a limited sample of pairs in the research areas to highlight snags and/or ambiguities for which

improvements were made before actual data collection. The purpose of the pilot study was to allow the researcher to make changes to the research instruments if flaws were discovered.

### **3.8 Validity of Research Instrument**

The content validity of the research instrument was assured by ensuring that the interview guide's items or questions were reliable and accurately reflected the study's research topic. The content validity focused on the extent to which the content of the instrument corresponds to the concept it is designed to measure. This research was able to examine the objective of the interview questions as compared to the perception among female junior high school pupils towards mathematics (Agyedu, Donkor & Obeng, 2007).

### **3.9 Reliability of Research instrument**

Reliability is an instrument concerned with its consistency of measurement. Thus, reliability refers to the extent to which an instrument measures the same way each time it is used under the same conditions with the same subjects. The purpose of reliability is to assess the instrument's ability to measure the same way in each administration to the same sample (Agyedu, Donkor & Obeng, 2007).

This research made use of integrated reliability. This is a concern with the consistency of people in the way they observe events. The purpose is to assess the consistency of agreement when two or more raters are judging the same variables independently of each other.

### **3.10 Data Collection Procedure**

Creswell (2008) stated that respecting the site where the research takes place and gaining permission before entering a site is of paramount importance in research. To this effect, an introductory letter was obtained from the Department of Educational Foundations, University of Education Winneba, stating the aim and purpose of the study and the need for the participants to give their consent and cooperation. This introductory letter was sent to the District Director of Education in the Upper Denkyira West to gain access to the school and the participants to facilitate the study. A copy of the letter was sent to the head of the selected school where the research was to be conducted.

The researcher visited the selected school to create a relationship with the head of the school as well as the participants and to seek their optimum co-operation for the study. The researcher guarantees them privacy and knowledgeable approval. Moreover, the date and time are scheduled with the respondents for the interview. The whole session took two weeks for the collection of data from the selected school.

### **3.11 Data Analysis Methods**

Bogdan and Biklen (2007) describe data analysis as working with data, organizing it into manageable units, synthesizing it, finding patterns, and discovering what is (important and what to learn). Qualitative data in the form of recordings and note-taking through interviews were transcribed. The final output was presented in the form of texts and direct quotes from key respondents. The application of this method of analysis in the study was based on the fact that the original views of respondents would be demonstrated without any biased interference with the view of the researcher.



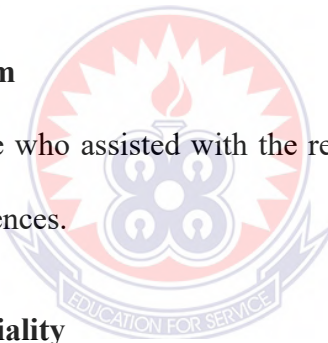
To help focus the interviews in terms of reflecting the main objectives of this study and simplify the analysis of the qualitative data, the interviews were structured according to research questions. These research questions reflected the overall aim and perception among female junior high school pupils towards the study of mathematics in Upper Denkyira West. However, respondents' answers to different questions were also cross-referenced to build up a fuller picture of what the data is telling us.

### **3.12 Ethical Issues Considered**

The researcher executed the practice of the ethical procedure researchers in conducting research including the following:

#### **3.12.1 Avoided plagiarism**

The contributions of those who assisted with the research were acknowledged in the text as well as in the references.



#### **3.12.2 Assured confidentiality**

The respondents were assured the researcher would conceal their identities. In achieving this goal, respondents were given codes they wrote on their interview guide sheets instead of their names which made it difficult for individuals to identify the respondents. Individual respondent is assured that they can always voluntarily withdraw from the study. The researcher also destroyed the used notes taken from the interview as soon as possible.

#### **3.12.3 Informed consent**

To avoid infringing on the principle of informed social research consent, letters of introduction were sent to the institutions to seek their consent before the research was

conducted. The purpose of the study was clearly stated in these letters both to the respondents and to the institution's authorities.

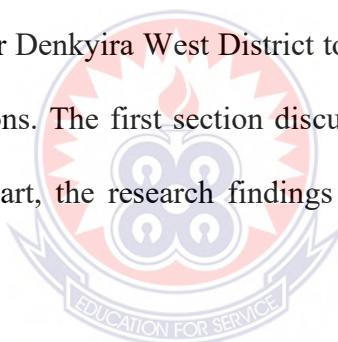


## CHAPTER FOUR

### DATA ANALYSIS AND DISCUSSION OF FINDINGS

#### 4.0 Introduction

This chapter explains how to analyze and evaluate the data gathered from participants during primary data gathering. The study's goal was to find out the perception among female junior high school pupils towards the study of mathematics in the Upper Denkyira West District. The researcher gathered information from female junior high school students at Nkronua D/A Basic School in the Upper Denkyira West District in the Central Region of Ghana. The information was analyzed and debated in light of the research questions. Thirteen female junior high school pupils from Nkronua D/A Basic School in the Upper Denkyira West District took part in the study. This chapter is divided into two sections. The first section discusses the candidates' demographic features. In the second part, the research findings were presented according to the research questions posed.



#### 4.1 Demographic Results

This section provides a demographic profile of the respondents to set the stage for the study findings presented in this chapter.

The study included 13 female junior high school pupils from Nkronua D/A Basic School. The age of the participants in the study ranged from 12 to over 17 years old, with two (2) individuals representing 13 percent being between the ages of 12 and 14, five (5) representing 30.8 percent being between the ages of 14 and 16, and six (6) representing 53.8 percent being over 17 years old. This indicates that the participants were adolescents. Therefore, the possibility of the mathematics teachers' teachings in the abstract would make it difficult for most pupils to understand the lesson.

## 4.2 Research Question 1

### Why do female junior high school pupils perceive mathematics as a difficult subject?

From the interview, it was revealed that the perception and attitude of the teacher, the nature of the mathematics syllabus, and the lack of teaching and learning materials were factors that make female junior high school pupils perceive mathematics to be a difficult subject.

#### Theme 1: Lack of Teaching and Learning Materials

The respondents revealed that lack of teaching and learning materials was a factor making mathematics as difficult as it is. Their responses are presented below;

A respondent said:

*“There are no teaching and learning materials in my school, making mathematics very difficult to learn. Materials like a textbook, board instrument and other items that aid in smooth learning and understanding of mathematics”.* [R7]

Another respondent revealed that:

*“I’ve never seen my mathematics teacher working with drawing instruments on the blackboard since I started junior high school. He constantly has to improvise before he can complete a task, especially when it involves instruments, and this bothers me and makes the subject tough”.* [R2]

Another respondent revealed that:

*“I do not have a textbook or any mathematics book for me to study and there is no book for me to go and practice what was taught in the class. I think, if there are books or extra materials, I can perform well in mathematics and it will be easier instead of it being a difficult subject”.* [R11]

Another respondent said:

*“In my case, I have an AKI – OLA mathematics textbook that I utilize, but I still find it difficult to comprehend. If*

*there was more information, such as videos, to aid my learning, I believe these videos would be useful in removing some of my doubts about some of the topics covered in class”. [R6]*

Another respondent said that:

*“The use of extra materials or books makes learning mathematics easier and understandable but here is the case that my school does not have some extra materials to help me in my studies of mathematics. The examples given are not enough for me to grab the concept of mathematics in class”. [R1]*

A respondent also said:

*“Studying mathematics without additional materials like textbooks, videos and others make it difficult for me. Since only one textbook cannot help me to understand the topics treated in class. I think other forms of this material can boost my understanding when it comes to learning mathematics”. [R5]*

Again, a respondent revealed that:

*“Since it is the free educational system, provision of textbooks by my parents has become a problem. My parents do not want to buy any textbooks for me with the impression that the Government will provide textbooks. This has made me lose interest in studying mathematics and my performance has also declined. If the problem of inadequate teaching and learning material in my school is solved, I think I might develop much interest in mathematics”. [R9]*

A respondent also revealed that:

*“Lack of learning and teaching materials in my school has declined my performance and interest. Mathematics is a subject that you have to study always, especially when you do not understand it. I don't have a textbook or materials of my own that will make me understand and build the interest I want in the subject. If there are some mathematics materials aside from the textbook, I believe things might change for the better”. [R12]*

*“I don't have any material except my mathematics notebook which contains little examples solved in class. This makes my understanding difficult. I well-prepared learning materials may boost my performance in mathematics”. [R4]*

Another respondent revealed that:

*“Learning mathematics without additional materials is very difficult. In my case, I have no math textbook to aid me in my studies. This has brought my interest and performance down”.*  
[R10]

The foregoing comments demonstrate that a lack of teaching and learning resources is one of the variables that influence how female junior high school students view mathematics. Teachers do not employ teaching and learning materials, and only a few extremely good students participate in math classes with any level of knowledge Aina, Olanipekun, and Garuba (2015).

## **Theme 2: Perception and attitude of mathematics teacher**

Another key aspect that contributes to mathematics difficulty, according to respondents, is the teacher's attitude and perception. Their responses are presented below;

A respondent said:

*“Anytime we have mathematics, my teacher will be making fun of us saying if you can't solve this question, then you to be on the farm cultivating some cassava for the country. He kills my momentum for trying to understand what he is doing”.* [R11]

Another respondent revealed that:

*“I know girls do not do much when it comes to mathematics because I have learned to understand that girls are good at reading subjects than performing calculations. My teacher always tells me to read general art when I found myself in senior high school”.* [R10]

Another respondent also said:

*“My teacher does not laugh when he comes to class. He always frown his face and this makes me uncomfortable in his class. If you want, him to clarify something for you, he says I don't have your time to waste on dull pupils like you,*

*and because of that I don't put up any effort to learn his subject". [R4]*

A respondent also revealed that:

*"Why should I worry myself learning a difficult subject like mathematics while my teachers do solve the questions when it comes to issuing of B.E.C.E time? My teacher will do the needed so what is the essence of wasting time studying mathematics on my own". [R12]*

Another respondent revealed that:

*"I do not like coming to math class because I don't comprehend the mathematics itself and my teacher always criticized me. This has made me lose interest in the subject". [R 8]*

A respondent also said:

*"As for my mathematics teacher, he always spends few times in math class with us without doing much of the learning. And because of that, he brushes over the topics making it difficult for me to understand the subject itself". [R13]*

Another respondent also said:

*"I have always been ridiculed by my mathematics teacher in class since I'm not able to give an accurate answer. Because of that, I do not partake in a mathematics lesson and sometimes stay away from school to prevent further embarrassment from colleagues and my teacher as well". [R9]*

Given the above remarks, it is clear that teachers' attitudes and perceptions contribute to the factors that discourage pupils from learning mathematics. Pupils and even adults frequently attempt to live up to or below expectations. As a result of being publicly labeled as delinquents, young people tended to become even more delinquent (Farrington & Welsh, 2007). Teachers, according to Alter, Walker, and Landers (2013), have a significant impact on students' perceptions of mathematics and their achievement in it. That example, if a student believes that a teacher holds a negative impression of him or her, the student may perform as expected.

### Theme 3: Nature of syllabus

Some of the respondents stated that the syllabus nature is also a factor in why female junior high school pupils perceive mathematics as a difficult subject. These are some responses from the respondents

A respondent said:

*“The mathematics syllabus is broad, and completing it takes a lot of time and effort. This forces me to memorize what I can and leave the rest to chance. My teacher will only give me the areas in which I am interested in coming to the examination to prevent me from studying everything”.* [R8]

Similarly, another respondent revealed that:

*“The syllabus content is just too lengthy for junior high school students to complete in the allotted three years. The most intriguing aspect is that, even with your teacher's assistance, we do not complete the entire subject, let alone me”.* [R3]

Another respondent also revealed:

*“The content of mathematics syllabus should be reduced to about ten chapters only to make learning and understanding easier. There are about thirty- five chapters in one mathematics book that always kills my vim anytime I pick it to study. It should be less so that it can learn with ease”.* [R6]

A respondent said:

*“The content of syllabus used in school is too large and making me scared of learning the subject. If the content is reduced to a sizable volume of about ten to twelve topics, it might motivate me to build some passion for learning it”.* [R11]

Another respondent also revealed that:

*“The topics in our mathematics syllabus are plenty and I have to learn everything before I can pass my exam which I can't. Due to the huge volume and content of the mathematics syllabus, put me away. It should be reduced so that I will not be scared of it”.* [R5]



Another respondent revealed that:

*“The nature of the mathematics syllabus should be changed from its theoretical aspect to a practical aspect. I think if it is made practical, it might boost my interest and understanding and again, my performance too”.* [R1]

Responses from the respondents indicate that the curriculum is also a contributing factor to the perception among female junior high school pupils, perceive mathematics as a difficult subject. Saville, Zinn, Brown, and Marchuk (2010) suggest the syllabus that considers pupils to be incapable of Meta-cognitive (e.g., complex reasoning) should be replaced with the one that sees pupils who are capable of higher order thinking and reasoning when supported with the necessary relevant knowledge and activities.

Other factors revealed by the respondents from the interview include fear and poor teaching methods. These items have also contributed to the difficulty of mathematics for female junior high school pupils.

#### **Theme 4: Fear of mathematics**

Few of the respondents admitted that their dread of mathematics has turned into a nightmare, causing their enthusiasm for the subject to wane. Their responses are presented below;

A respondent revealed that:

*“When it comes to mathematics, I am nervous since I don't comprehend the subject and don't appear to care about what happens in class. Because I'm terrified, I either sleep or take French leave from class”.* [R12]

Another respondent also revealed that:

*“I am terrified of mathematics because I am unable to solve issues that are presented to me. I've had the phobia since primary school, and I've never been able to overcome it because of the canes and insults I've received when I don't offer an accurate response to a question”.* [R7]

Similarly, another respondent also revealed:

*“My inability to do math problems correctly enrages my teacher, who punishes me with canes. Sometimes the way he speaks makes me feel nervous, and I decide not to attend mathematics classes”.* [R2]

The above statements revealed that most female junior high school pupils fear mathematics due to some attitude's teachers in the rural setting and the inability on the part of pupils to solve mathematical problems. Swars, Daane, and Giessen (2006) confirmed that fear of both answering mathematical questions in class and talking about mathematical tests could be escalated to a level termed mathematics anxiety which leads to negative learning of mathematics.

#### **Theme 5: Poor Teaching Methods**

The respondents indicate that teaching method is also another worrying factor female junior high school pupils see mathematics to be difficult. Their responses are presented below;

A respondent said:

*“My teacher's method of teaching mathematics in math classes always makes me bored. He writes the questions on the board and then begins to solve them with few explanations”.* [R13]

*“When answering questions in class, he always addresses the blackboard rather than the entire class. He also answers his questions since he claims that time is limited and that he wants to finish the topic quickly so that he may move on to another topic or class for his next sessions”.* [R9]

Another respondent revealed that:

*“Many examples help students comprehend and enjoy mathematics, but my teacher only gives two examples before moving on to the next topic, much to my surprise. He teaches as though I had the same level of expertise as he does, which has depleted my enthusiasm for arithmetic”.* [R1]

A respondent revealed that:

*“My teacher has zero patience in a math lesson since he gets irritated rapidly when I state that I don't comprehend the concept of the material he is presenting. We seem to know everything there is to know about the subject, so he brushes them aside and moves on. Instead of teaching us how to grasp mathematics, he lectures”.* [R5]

A respondent also said that:

*“My teacher's method of teaching mathematics in class has been one way. My teacher does all the explaining without involving us with questions”.* [R12]

Another respondent revealed that:

*“My teacher always presents us with fewer examples. More examples in math lessons make me comprehend the topics or the subject. But if the examples given are few then it makes learning more difficult for me”.* [R4]

According to the responses from respondents, poor teaching methods make mathematics difficult for female junior high school students. Bolajie (2005) supported this by stating that teachers' reception, method of teaching, and personality all play a significant role in students' positive or negative perceptions of mathematics.

Why do female junior high school students perceive mathematics as a difficult subject is summarized? Syllabus nature, inadequate teaching method/style, teachers' attitude, and perspective, and lack of teaching and learning materials, as well as fear, are all major reasons why mathematics appears tough for female junior high school students.

Many researchers have reported on the issues that impede the progress and performance of female junior high school students. Teaching and learning resources are important for mathematics teaching, according to Clausen-May (2005). Swan, Marshall, and White (2007) also stated that in mathematics classes, children must be allowed to work with manipulative materials. According to a separate study, the curriculum contributed to pupils' perceptions that the mathematics concepts taught in schools are too hard for them to grasp. Kithaka (2003) agreed that the course includes too much theoretical mathematics instruction, making the subject appear too abstract and difficult for pupils to grasp.

#### **4.3 Research Question 2**

##### **What challenges do female junior high school pupils face towards mathematics?**

Lack of parental support, lack of practice of concept taught, and lack of motivation are some of the challenges female junior high school pupils faced towards learning mathematics. Below are their responses:

##### **Theme 1: Lack of parental support**

The respondents indicated that lack of parental support hinders their performance in mathematics. Their responses are presented below.

A respondent said:

*“My parents are not educated, and they show less concern about my education because of free education. They do not provide me with the needed learning tools to help facilitate my progress in my educational life. Since we are in the farming community, I have to rush home and prepare to farm. I help them, and they care less about my studies than their farming activities. This has become a challenge for me to even concentrate on my studies, including mathematics”.*  
[R12]

Another respondent revealed that:

*“Immediately after I closed from school to the house, I moved straight to the shop to sell. I spent the rest of the day at the shop without opening my books to revise what I was taught at school because I had to take care of the customers who were buying. I only go through my books when I have a math lesson the next day. I don't have time to practice what I am taught at school due to the nature of my house chores and it has become a challenge in my weak performance in mathematics and other subjects too”. [R8]*

Another respondent also revealed that:

*“My parents do not know education, but they are farmers, so their attention is mostly on their farms and how to get funds to feed the family as well. When it comes to my studies and education, it is a major challenge because they say there is no money available for them to buy a textbook for me. Isn't it true that the government promised free education, so why doesn't it provide learning materials for your studies? My parents stated”. [R10]*

Similarly, another respondent also revealed that:

*“My parents are math-phobic, so they never assist me anytime I ask for their help when it relates to mathematics. They told me that mathematics was their worst enemy back in their school days. Due to this, they never supported me when it came to maths and didn't care to purchase a maths textbook. I like mathematics because whatever we do contains a little bit of mathematics in it, and I wish they could support me to perform better in mathematics”. [R 5]*

Another respondent also revealed that:

*“I didn't stay with my parents, and they don't know where I stayed. It has always been me struggling to make a living. They left me when I was in primary five till now, whatever goes on in my life, they don't mind. If they had been there to support and guard me, I think things could have been better for me, especially my education and my performance in mathematics”. [R13]*

The above responses from the respondents confirmed that lack of parental support is a challenge female junior high school pupils face towards learning mathematics in rural areas as compared to the urban areas. Ghimire (2011) argued that family support plays

a vital role in children's education. According to this viewpoint, parents must play an important role in their children's upbringing to improve their performance, particularly in the case of females.

## **Theme 2: Lack of practice of concept taught**

Other respondents indicated that lack of practice in mathematics taught is their major challenge. Their responses are presented below;

A respondent revealed that:

*“The study of mathematics needs constant practice and extra time, and here it is that I don't get that extra time and materials to even practice constantly on my own. I just depend on the little note my teacher gave in class, which is not enough for me to do more to educate myself when it concerns mathematics. Again, I can't afford to pay for private classes due to financial constraints on the part of my parents”. [R4]*

Another respondent revealed that:

*“Mathematics is a subject that isn't for lazy pupils because it needs constant learning. I feel lazy anytime I pick up my maths notes to study. Calculation subjects make me feel sleepy and lazy because I don't seem to get the correct answer to a question. Laziness on my part has caused me to not practice maths”. [ R7]*

Another respondent also revealed that:

*“After school, I have to rush home and prepare for the farm since my mother is already there farming. My mother and I come to the house in the evening, and I go straight to the kitchen to prepare supper for the family. I finish all the chores late at night, and there is no time for me to practice what we did in school. No extra tuition or learning materials to at least help me practice and understand the concept”. [ R2]*

Again, another respondent also revealed that:

*“As for me, practicing what we did in school is a problem because I don't have a textbook and my teacher gives two examples of a topic and its subtopics, which isn't enough for*

*me to do this continuous practicing. I don't have the money to pay for additional tuition. Sometimes, my teacher does organize free extra classes, but I don't get the chance to attend since I have to go home immediately after school closes to do my household chores". [R11]*

The results from the respondents indicate that female junior high school pupils are facing a challenge due to a lack of practice of concepts taught in the rural setting. Thapa (2011) confirmed that for better performance in mathematics, students should be ready for extra practice. This proves that pupils in rural areas need additional time and parents should try and give them extra time and tuition to help bridge the gaps in their mathematics performance.

### **Theme 3: Lack of motivation**

Respondents show that lack of motivation has been a challenge to them and making learning mathematics a problem. Their responses are presented below;

A respondent revealed that:

*"Anytime I take an exercise in mathematics, I score a lower mark and it reduces my confidence level, which does not motivate me to study. No one else encourages me to take mathematics seriously. There is no female teacher in my school who teaches the subject. It has always been male teachers throughout my school. If a woman took up the mantle of teaching mathematics, it might inspire me to take it seriously and boost my confidence". [R6]*

Another respondent revealed that:

*"Most female pupils who graduated from my school didn't select programs related to mathematics when selecting programs for their second cycle education. The majority of them picked home economics, which involves less calculation. This does not encourage me to take it seriously because I will also think of selecting the same program to get me away from many calculation subjects". [R9]*

Another respondent revealed that:

*“I lack confidence, which diminishes my interest in learning mathematics. There are no female persons with a mathematics background in my community. I also don't know the careers that are related to mathematics. So, I don't get any form of motivation to increase my confidence level in taking mathematics seriously”.* [R1]

The above statements from the respondents clearly show that motivation helps pupils perform better. A highly motivated employee gives his or her all to his or her job. Etsey Amedahe and Edjah (2005) revealed that a lack of motivation and professional commitment produce poor attendance and unprofessional attributes towards students, which in turn affect the performance of students academically.

The study revealed that female junior high school pupils face a lot of challenges in learning mathematics, and these challenges include a lack of parental support, a lack of practice of concepts taught, and a lack of motivation on the part of mathematics teachers, parents, and pupils. All of this means that female junior high school students in rural areas have traces of a variety of attitudes geared negatively toward the study of mathematics.

#### **4.4 Research Question 3**

**How do female junior high school pupils attempt to overcome the challenges faced towards learning mathematics?**

It was shown in the study that, female junior high school pupils attempt to overcome the challenges faced towards learning mathematics through the use of e-learning, group studies, and changing pupils' attitudes towards mathematics.



## Theme 1: E-Learning

Most of the respondents revealed that they use electronic- learning platforms to overcome some of the challenges they faced in learning mathematics. Their responses are presented below;

A respondent said:

*“At home, I have a smartphone that I frequently use to access several electronic learning platforms to gain a better grasp of mathematics. To augment what my instructor teaches in class, I follow the steps utilized to answer mathematical issues. I spent every spare time I had to learn, especially mathematics, on these platforms at home”.* [R9]

A respondent revealed that:

*“I watched a multimedia station called Joy Learning to obtain a better knowledge of the issues I didn't comprehend. I utilized the Joy learning platform to study and comprehend the notion of how to solve mathematics problems because I didn't have a textbook”.* [R5]

Another respondent also revealed that:

*“Because my parents cannot afford to pay for my extra tuition, I usually turn to the television. Many television stations broadcast educational programming, including math. I took advantage of the chance to polish up on my knowledge of the topics covered in class”.* [R12]

Some respondents also said:

*“The covid - 19 pandemic has also provided me with a chance since a multimedia station has produced these teachings, which I have been studying and which have significantly helped me. It even helps me grasp some of the mathematical topics we cover in class. This has allowed me to practice at home during my spare time”.* [R6]

*“Because I don't have somebody to explain mathematics to me at home, I generally obtain my comprehension from these classes shown on television channels. This has also taught me how to conduct independent research to enlighten myself, as well as motivate me”.* [R10]

A respondent revealed that:

*“My parents are not well educated, so I use their mobile phone to search for information on mathematics topics from the multimedia station or sometimes join the virtual class to acquire a better understanding. This has helped me to overcome the challenge of inadequate learning materials at my ends”*. [R4]

Similarly, a respondent also said:

*“Because I had no one to explain things to me about mathematics so, I always utilized my parents' phone to go to the YouTube platform or watch practical mathematics online. My understanding of mathematics has been boosted and enhanced as a result of seeing these videos”*. [R13]

Again, another respondent also revealed that:

*“Because my teacher only provides two examples, I frequently use my dad's phone to browse the YouTube channel for other instances of topics discussed in class. It has helped me and kept me on my toes by encouraging me to practice at home with the change I receive, as well as providing me with additional learning tools”*. [R2]

According to the respondents, e-learning (visual learning) has been utilized to supplement the additional learning materials they require to increase their performance and knowledge in mathematics in rural areas. Visual learning that is exciting for learners, easy to follow, and increases knowledge could be facilitated by employing films to illustrate such concepts. The use of multimedia technology in the classroom has been proven to be engaging and inspirational to students Hwang, Hung, and Chen (2014).

## **Theme 2: Group studies**

Few respondents indicated that group learning has helped them to overcome some barriers faced in learning mathematics. Here are their various responses quoted below;

A respondent revealed that:

*“I formed a group with a few of my friends, and it has been extremely beneficial to me. On Saturdays and Sundays, we always get together to talk about math topics that we've been learning in class. During the group discussion, others share different ideas and methods to help me better understand the topic. It has also significantly aided and boosted my self-assurance”.* [R7]

Another respondent also said:

*“Group studies have been more beneficial to me because I've gained a better understanding of how to think critically before approaching a mathematical problem thanks to the ideas shared by my classmates. It has prepared me, and I believe it will encourage others to pursue mathematics”.* [R8]

Another respondent revealed that:

*“Because I don't understand what's being taught in class, I've joined a study group to assist me in grasping the concepts being taught at school. On weekends, a group meeting is held to discuss and share ideas as well as solve problems”.* [R11]

The above responses from the respondents confirm that studying in groups has been a benefit to them as a way to overcome some challenges faced towards the study of mathematics. Group learning provides a medium for others to share brilliant ideas about what they know about a topic or subject. Yu and Liao (2012). argued that group work is best suited to learning processes that involve transcending the current level of understanding to reach a new perspective, rather than learning processes that involve the acquisition of new skills or procedures.

### **Theme 3: Changing pupils' attitudes towards mathematics**

Other respondents made mentioned of changing their attitude towards mathematics also aids in overcoming some of the challenges they face towards learning mathematics. These are the responses;

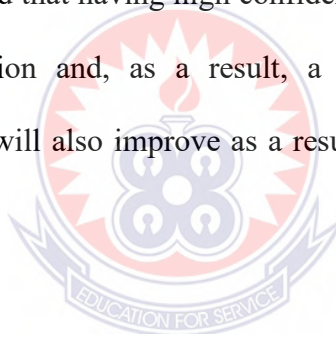
A respondent revealed that:

*“If I change my mindset regarding mathematics and accept that it isn't tough, but it does require constant study and practice, I believe it will help me fully understand the subject and enhance my performance, as well as give me the capacity to think critically before tackling any issues”.* [R1]

Another respondent also revealed that:

*“I've always thought of mathematics as a male-dominated subject, but if I change my thinking and take it seriously, I'll gain confidence and be more motivated to pursue a career in mathematics”.* [R3]

The statements made by the respondents indicated that if pupils change their mentality and attitude towards mathematics, they might produce high confidence and yield great performance. It is believed that having high confidence in their ability to do math will lead to a good perception and, as a result, a boost in motivation. Student's mathematics knowledge will also improve as a result of this (Southwell & Penglase, 2005)



#### **4.5 Chapter Summary**

According to the study female junior high school pupils revealed the factors that make them perceive mathematics as a difficult subject. These are the factors stated by them including the perception and attitudes of teachers towards female junior high school pupils, the nature of the mathematics syllabus, lack of teaching and learning materials, and poor teaching methods used by some teachers. The study also revealed female junior high school pupils' challenges in studying mathematics. These challenges are lack of practice of concept taught, lack of parental support, and lack of motivation on the part of mathematics teachers, parents, and pupils as well.

All these challenges make female junior high school pupils exhibit various kinds of negative attitudes towards the study of mathematics. Female junior high school pupils have been found to try to overcome these obstacles by using electronic learning platforms or virtual courses, telecasting learning programs on television, and group studies.



## CHAPTER FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### 5.0 Introduction

This chapter contains conclusions drawn from the study, recommendations given to female junior high school pupils, and suggestions for further study.

#### 5.1 Summary

This study explored the perception among female junior high school pupils towards the study of mathematics. It reveals the factors that make female junior high school pupils create the perception of difficulties in the study of mathematics which hinders their interest and performance in mathematics. The study made use of a qualitative research design. Primary data was obtained using interviews from 13 purposive selected female junior high school pupils at Nkronua D/A Basic School in the Upper Denkyira West District of the Central Region. The final output was put in the form of direct text from the respondents without any bias interference from the researcher.

#### 5.2 Key Findings

The findings of the study were based on the research questions:

##### **Why do female junior high school pupils perceive mathematics as a difficult subject?**

Poor teaching methods, inadequate teaching and learning materials, mathematics teachers' perceptions and attitudes, mathematics anxiety, and the nature of the syllabus are the major factors that female junior high school students in rural areas perceived as contributing to the difficulty of mathematics. These factors were revealed by the respondents through the interview held by the researcher.

### **What challenges do female junior high school pupils face towards mathematics?**

The main barrier to female junior high school pupils learning mathematics was a lack of parental support. Female junior high school pupils are lacking in motivation since there are no female role models with mathematical skills and vocations to look up to.

### **How do female junior high school pupils attempt to overcome the challenges faced towards learning mathematics?**

Female junior high school pupils sought to overcome the challenges they experienced by using electronic learning platforms or virtual classrooms to help in their grasp of the topic and to obtain extra learning resources. They also go to group studies to obtain access to mathematical expertise from peers, as they communicate thoughts on topics taught in class.

### **5.3 Conclusion**

These conclusions were drawn from the analysis made:

1. Female junior high school pupils in rural areas regard mathematics as a difficult subject due to poor teaching techniques, teachers' perceptions and attitudes, a lack of teaching and learning resources, fear of mathematics, and the structure of the syllabus.
2. Lack of parental support, lack of practice of concepts taught, and lack of motivation on the side of mathematics teachers, parents, and students were some of the challenges female junior high school students experienced when it came to studying mathematics.
3. They lose interest and confidence in mathematics as a result of the challenges they confront. It also causes pupils to have a variety of unfavorable attitudes toward mathematics and causes them to drop out of school.

#### 5.4 Recommendations

Based on the findings drawn from the study, which tends to address the perception among female junior high school pupils towards the study of mathematics in Upper Denkyira West District as reflected in the study, the following recommendations are made:

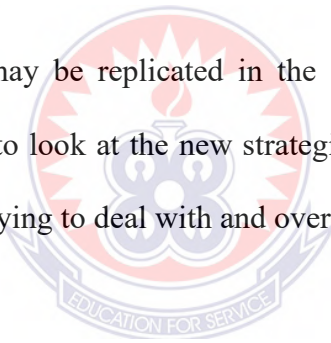
1. Mathematics teachers must be encouraged to make use of appropriate teaching methodologies. They must try also to vary their method of teaching with more interesting methods to drive the interest of their female pupils in the learning of mathematics.
2. Government and agencies in the education sectors must provide the needed teaching and learning resources to aid teachers in making the teaching of mathematics livelier and more interesting to their students.
3. The mathematics syllabus must not be loaded with too many topics. The syllabus must be simplified and designed in a way that the pupils can learn on their own.
4. Parents of pupils must be responsible and have an interest in their children's education, especially the female ones.
5. Female pupils must be self-motivated to study mathematics.
6. Parents and teachers must also motivate female pupils who show interest in the study of mathematics. This will help them serve as role models to their peers.
7. Educational institutions must adapt and encourage the use of ICT in the study of mathematics subjects in their schools.
8. Peer learning must also be encouraged especially among female pupils to help them increase their confidence level in studying mathematics.



### **5.5 Suggestions for Further Research**

Some of the findings and conclusions of the study suggest possible directions for further research. Some suggestions regarding such directions are given below.

1. The study should be repeated in other regions for basic schools. Because the study was done in only one junior high school in the Upper Denkyira West District, it should include schools in both urban and rural locations to allow for interregional comparison and offer a foundation for broader conclusions.
2. The research focused on only female junior high school pupils. Future research could be conducted on male and female junior high school pupils in the school. To help also find out some of the problems male pupils also face in mathematics.
3. The same study may be replicated in the same location after a few years, perhaps 10 years, to look at the new strategies that female junior high school students are employing to deal with and overcome these problems.



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## APPENDIX

UNIVERSITY OF EDUCATION, WINNEBA

FACULTY OF EDUCATIONAL STUDIES

DEPARTMENT OF EDUCATIONAL FOUNDATIONS

**SEMI-STRUCTURED INTERVIEW GUIDE FOR FEMALE JUNIOR HIGH  
SCHOOL PUPILS**

**GENERAL INSTRUCTION**

Dear Respondent,

*This interview is to explore the perception among female junior high school pupils towards the study of mathematics. Please respond to all the questions as cordially as possible. There is no right or wrong response. The information you give will be used purposely for this research. Confidentiality will be maintained.*

*Thank you.*

**PART A: Demographic Data**

*Please listens to the following questions carefully and give the appropriate answers as necessary. Tick the appropriate class you belong to.*

1. Age: .....

2. In which class are you?

JHS ONE [ ]

JHS TWO [ ]

JHS THREE [ ]

## PART B

3. What challenges do female junior high school faced towards learning mathematics?
  - i. Do you face any challenges in learning mathematics?
  - ii. What are some of the challenges you encounter related to the study of mathematics?
  - iii. Do you find it difficult in reading mathematical questions?
  - iv. Are you motivated enough to study mathematics or solve mathematical questions?
4. Why do female junior high school pupils perceive mathematics as a difficult subject?
  - i. How do you see mathematics as a subject?
  - ii. Why do you dislike mathematics?
  - iii. Does your mathematics teacher contribute to the difficulty of learning mathematics?
  - iv. Are you given the required materials needed to solve mathematical problems?
  - v. Do you show any sign of fear when learning mathematics?
5. How do female junior high school pupils attempt to overcome the challenges faced towards learning mathematics?
  - i. What are some of the ways you think can help yourself to solve the challenges faced in learning mathematics?
  - ii. What will you do to help in understanding the basic concept of mathematics?
  - iii. Can the government play a role in the phenomenon?