INFLUENCE OF GENDER, SCHOOL LOCATION AND SCHOOL TYPE ON STUDENTS' ACADEMIC PERFORMANCE IN SENIOR SECONDARY SCHOOL MATHEMATICS IN ADAMAWA STATE, NIGERIA

BY

AMAHYEL, Miriam Zoaka
M.Tech/SCE/16/0867

AUGUST, 2019

INFLUENCE OF GENDER, SCHOOL LOCATION AND SCHOOL TYPE ON STUDENTS' ACADEMIC PERFORMANCE IN SENIOR SECONDARY SCHOOL MATHEMATICS IN ADAMAWA STATE, NIGERIA

By

AMAHYEL, Miriam Zoaka
M.TECH/SCE/16/0867

A THESIS SEMINAR SUBMITTED TO THE DEPARTMENT OF PHYSICAL SCIENCE EDUCATION, MODIBBO ADAMA UNIVERSITY OF TECHNOLOGY, YOLA IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF M.Tech (ED) IN MATHEMATICS

AUGUST, 2019

DECLARATION

I Amahyel, Miriam Zoaka hereby declare that this thesis is written by me and it is a record of my own work. It has not been presented before in any previous application for a higher degree. All references cited have been duly acknowledged.

_____ _____

SIGN DATE

APPROVAL PAGE

This thesis "Influence of Gender, School Location and School Type on Students' Academic Performance in Mathematics in Senior Secondary Schools in Adamawa State" meets regulations governing the award of Master degree of Technology Education in Mathematics of the Moddibo Adama University of Technology, Yola and is approved for its contribution to knowledge and literary presentation.

_____ _____

Dr. K. M. Fasasi Date

(Supervisor)

_____ _____

Name and Signature Date

Internal Examiner

_____ _____

Name and Signature Date

External Examiner

_____ _____

Dr. K. M. Badau Date

Head of Department

_____ _____

Prof. M. M. Malgwi Date

Dean, School of Postgraduate Studies

DEDICATION

This work is dedicated to my husband Yusuf Philip Bello. It is also dedicated to my late parents, Mr Amahyel Ndahi and Mrs Dija Amahyel.

ACKNOWLEDGEMENTS

I wish to express my immeasurable gratitude to the Almighty God for His love and protection throughout the period of the study. Lord, I am overwhelmed for all you have done for me. My sincere appreciation goes to my dynamic and able supervisor, Dr. K. M. Fasasi for his guidance, corrections, and promptness in attending to me despite his tight schedules. Sir, I say thank you. I'm also grateful to my Head of Department Dr. K. M. Badau. My sincere thanks also goes to Dr. A. U. Okoronka for his beneficial advice. My profound gratitude goes to Dr. A. H. Abubakar and Dr K. Waziri for their corrections. My heartfelt gratitude goes to Dr. F.M. Joda for her motherly advice and considerations. Included in the list are also all the authors whose books I consulted, may the good Lord bless you all. My lecturers in the department of science education, I appreciate you all: Prof. G. Danjuma, Prof. M. M. Fabunmi, Prof. R. O. Ugwuadu, Dr. J. Sakiyo, Dr. A. A Chiroma, Dr. A. Bello, Dr. A. Francis, Dr. Olowoselu. Dr. A. Y. Yahaya, Dr. K. Isa, Mr. I. Gengele, Mr. A. Abel, Mr. O. Emmanuel and all the non-teaching staff in the department for your contribution during the period of the study.

My sincere appreciation also goes to Dr. A. A. Momoh, Dr. S. Musa, Prof. I. Isa and all my lecturers in Mathematics department for their support and contribution towards the success of this programme. I deeply appreciate Mrs. F. Jatua, P. J Banu, Mrs H. Bello staff and students of all the Senior Secondary Schools the research was conducted.

My appreciation goes to my family members in persons of, Mrs. H. A. Ira, Mrs. P. D Mshelia, Mr. and Mrs. Y. B. Bdliya, Mr. and Mrs. I. H. Mshelia and Mrs. R. Y. Mark. My deep appreciation goes to my dearly beloved husband and friend Mr. Yusuf Philip Bello for his support, counsel and encouragement. To Amahyel Julius, Albert, Dilli, and Patience who are my children for their immeasurable sacrifices as well as show of understanding with me throughout the period of the study.

I wish to convey my sincere gratitude to my friends. Aunty V. D. Hamman, Mrs. F.A Fasasi, Mrs. C. Jibasen, Mrs. Gworgwor, Mrs. T. M. Elisha, Dr. A. J. Madugu, L. H. Zoaka, L. B. Gundiri, Hajiya B. Yusuf, and S. A. Patrick. I am also grateful to my course mates S. D. Bitrus, Samuel Malgwi, A. Abdullahi, A. O. Hyacinth, B. Gesium, M. Fori and U. M. Pariya.

ABSTRACT

The study investigated the influence of gender, School location and School type on students' academic performance in Mathematics in senior secondary schools in Adamawa State, Nigeria. The study was set to investigate if gender, School location and School type may have significant influence on students' academic performance in Mathematics. The population of the study consisted of 27,432 Senior Secondary II public School students in Adamawa state. Out of this population a purposive random sample of 709 students (354 males and 355 females) were used for the study using Taro Yamane formula. The sample was purposively selected in 12 Senior Secondary Schools from the five education zones in Adamawa State. The research design was expo facto design, using 2 x 2 x 2 (two-by-two-by-two) factorial matrix. The instrument used for data collection was Mathematics Performance Test (MPT), which was adapted from past WAEC and NECO questions papers "between" 2013-2017. Three research questions and four hypotheses were raised and tested. The research questions was tested using standard deviation. Z-test was used for testing hypotheses 1, 2 and 3, while Analysis of Variance (ANOVA) was used for hypothesis 4, all hypotheses were tested at 0.05 level of significance. The result of the analysis of hypothesis one (HO_1) indicates that there is significant mean difference between male and female students in Mathematics with [Z=2.09, df=707, Mean Diff.=1.12, p(0.04)<0.05]. Hypothesis two (HO_2) indicates significant mean difference between rural and urban students with [Z=3.53, df=709, Mean Diff.=1.88, p(0.00)<0.05]. Hypothesis three (HO_3) indicates there is no significant difference between boarding and day students' performance with [Z=0.07, df= 709, p (0.99)>0.005]. The finding in respect of hypothesis four (HO_4) using One-way ANOVA shows that, there was no significant influence in academic performance of students based on gender, school location and school type with [F = 0.02, df = (2, 2126), P = (0.99) < 0.05]. Based on the findings it was recommended that, constant practice of Mathematics on the side of students, meaningful revision, programmes and policies that will encourage female students should be organized by teachers, as well as provision of equal facilities and Mathematics teachers to both urban and rural schools.

TABLE OF CONTENTS **Page**

LIST OF TABLES

No

Title page

LIST OF APPENDICES

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Every individual needs Mathematical knowledge to function intelligently and efficiently in his or her world. Mathematics is one subject that is an integral part of every one life and affects virtually every field of human endeavor. An average man needs Mathematics to survive no matter how rudimentary (Charlse – Ogan & Alamina, 2014). Mathematics is both a language and tool of the sciences which enables the scientist to carry out their work, solve problems, interpret their findings and inventions, investigate and predict future and generally improve the world. Without Mathematical methods and symbols the scientist would be very handicapped in their work. Mathematics is the most widely used language on earth because of its extreme importance. Mathematics without doubt remains very important to all disciplines and fields of human work and study; it is a powerful tool and gate keeper for success in life, it is as old as man himself. There is no doubt about the fact that an individual can get on sometimes without knowing how to read and write, but can never sail through smoothly without knowing how to count, measure, add and subtract. The many uses and applications of Mathematics in the home, office, business, industries, agriculture, decision making and even in governance thrive are countless.

According to Odumosu (2012), Mathematics is regarded as the bedrock of science and technology. Odumosu observed that there is hardly any area of science that does not make use of Mathematical concepts to explain its own concepts, theories or models. In a similar view, Mathematics is regarded as the major tool available for formulating theories in the sciences, engineering, and economics as well as in other fields.

However, it is dishearten to note that with all the importance attached to Mathematics in Nigeria's education system, poor performance is being recorded among pupils and students in secondary schools and higher education programs that have Mathematics as a pre-requisite subject (Tata, Abba & Abdullahi, 2014).This situation continues to be worrisome and it becomes necessary to ask why students do not achieve high in this important subject. Many researchers (Usman and Memeh 2017, Adebola

(2007), Tata, Abba & Abdullahi 2014) in Mathematics and Mathematics education have offered various reasons for student's poor performance in Mathematics. According to Usman and Memeh (2007), the reasons include students' lack of interest or negative attitude towards the subject. Others are teachers' related factors such as poor teachers' preparation, shortage of quality Mathematics teachers, poor methods of teaching and non-use of instructional materials in the teaching of mathematics concepts. (Adebola, 2007).According to Tata, Abba and Abdullahi (2014), poor performance in Mathematic is one of the major reasons of decline in science and technology courses and development. Ojimba, (2012) was of the view that without Mathematics there is no science, without science there is no modern technology and without modern technology there is no modern society. Despite the importance attached to Mathematics by all stakeholders in education, senior secondary school students still perform poorly. The poor result in Mathematics performance indirectly affects the students overall academic performance. Ivowi (1993), asserted that the three traditional science subjects of mathematics, chemistry and physics are abstract in nature and therefore difficult to be easily grasped by student.

The Nigeria National Policy on Education as stated in the policy guidelines (Federal Republic of Nigeria, 2013) aims at producing literate and numerate citizens who can think logically and scientifically for themselves. Therefore, Mathematics was made a compulsory subject in our schools due its foundational role in the study of basic science. Science subjects like physics, chemistry and biology are the building blocks for most scientific and technologically based disciplines including engineering, medicine and computer science. A careful look at these science subjects reveals that their basic principles hinge heavily on Mathematics. Consequently, students' proficiency in Mathematics is believed to enhance their performance in these subject areas. The poor performance of students in Mathematics has been linked to several variables, such as low levels of aptitude, lack of interest in Mathematics and unfavorable attitude the course resulted in high levels of anxiety, which lead to poor performance (Adeyinka & Kaino 2014). Other factors such as attitude of students and teachers, study habit, teachers' qualification, teaching methods, school environment, Government policy, School location, family types have been identified as factors influencing students' academic performance (Alordiah, Akpadaka & Oviogbodu 2015).

Although gender differentiation exists in student performance in Mathematics. A study by Atovigba, (2012), observed that the male students outperformed their female counterparts in Mathematics. Furthermore, studies by Else-Quest, Hyde and Linn (2010) and Linderberg, Hyde, Petersen and Linn (2010) reported gender differences among male and female is closing and both perform similarly. In the study of geometry, the same situation and result holds in terms of gender achievement and performance Atebe (2008), Yang and Chen (2010) summed up that male students performed better than their female abilities while other studies by Etukudo (2014) found no significant differences in the performance of students in geometry and Mathematics in general at the secondary school level. Jebson and Wamdeo (2014) reported that there were no significant gender differences in academic performance in number and numeration, algebra, geometry and menstruations based on gender, school location and school type.

Interest in gender academic performance in Mathematics among the rural students has also stemmed from the fact that these students are the majority in Nigeria, as heavily populated developing nation in Africa (Abiam & Asim, 2007). These researchers pointed out that environmental provision is compounded in Africa where sex stereotyping is so pervasive that since at the early stages, the society fixes gender roles and other conditions. Males are perceived to play and act within the confines of intellectually and physically more challenging tasks, like construction, building, agricultural fishing and driving, while the females controlled such occupations as child care, food processing, cooking, mat weaving and pottery. Gender and Mathematics achievement therefore have been given greater attention by researchers in this field. Inequality in Science Technology and Mathematics Education (STME) has produced inconclusive results. One meta-analysis covering 1974-1984 on mathematics achievement and gender led to two conclusions: That the average gender gap in Mathematics achievement is very small (statistically insignificant) and the difference tends to decline with time (Friedman, 1989), as cited by Chebet (2016). Other researchers Ganley and Lubienski (2016), reported that at the elementary levels, boys and girls score similarly on many state tests, and girls get relatively good grades in Mathematics classes. However, some gender differences in Mathematics aptitude and skills appear during elementary school and ultimately, boys are much more likely than girls to pursue careers in some key Mathematics intensive fields, such as engineering and computer science. In recent years, concerns about boys and reading have taken some attention away from girls and

Mathematics, as girls have higher reading achievement than boys in early elementary school. However, gender gaps are larger among higher performing students which may partially explain why Ganley see gender gaps in Mathematics related careers, as these are often pursued by the highest performing students (Ganley, 2016). Ganley (2016) at the Florida center of research, stated that a number of different potential explanations exist for why these small gender differences persist and why larger gaps exist in mathematics related career choices. Some of the factors that have been found to contribute to gender differences in mathematics and Mathematics related career choices as discovered by Ganley (2016), shows that even from a fairly young age, girls are less confident and more anxious about Mathematics than boys. Moreover, these differences in confidence and anxiety are larger than the actual gender differences in Mathematics achievement. These attitudes are important predictors of Mathematics performance and Mathematics related career choices.

Boys tend to use more novel problem-solving strategies, whereas girls are more likely to follow school- taught procedures (Ganley, 2016), girls are more often follow teachers given rules in the classroom, and it could be that this 'good girl' tendency inhibits their Mathematics explorations and development of bold problem solving skills. Such differences may contribute to gender gaps in Mathematics as content becomes more complex and problem- solving situations call for more than learned procedures. According to Ganley (2016), boys tend to be stronger in the ability to mentally represent and manipulate objects in space, and these skills predict better than performance and career choices. Studies have shown that there is difference in academic performance between boys and girls. Abdullahi and Bichi, 2015, opined that gender of the students plays an influencing role on academic performance and that interest in gender-related differences in academic performance has been stimulated by concerns about the failure of the female students to achieve their academic potential. The findings suggested that girls tend to do better in English language, while boys tend to excel in mathematics, which supported the findings of (Ganley & Lubienski, 2016.

School location refers to the particular place, in relation to other areas in the physical, environment (rural or urban), where school is sited. School is one of the social institutions that is responsible for the development and training of the mind and skill of man. It is also for the preparation of man for the challenges and responsibilities in the society at large (Joseph & Emmanuel, 2017). Location has also been defined as the environmental condition around a school which could be urban or rural (Musibau, 2010). The location of the school

has been found to be crucial to students' performance in their examinations. Location of senior secondary schools in different countries in rural areas is widely dispersed from the students' homesteads. As a result longer walking or travelling distance from home to schools has mostly impacted school students particularly girls (Joseph, 2015). School environment differs, the level of academic performance may also differ. On the role played by environmental factors on students' academic performance in Mathematics, science and technology, there have been popular cultural views of rural education as deficit model (Hopkins, 2014). The relationship between school location and students' academic performance in Mathematics has been reported. For instance the findings of Steel (2007) revealed that a significant difference in rural- urban academic performance of students. Steel concluded that, children from the urban schools were superior in performance to their counter parts.

Furthermore, urban schools have main advantages like availability of resources, library, opportunities, good environment, teachers etc. However, one of the greatest advantages of rural schools is the tendency for smaller classes, which promise increased student evaluation, and provide greater flexibility in teaching strategy as cited by Alordiah (2015) Igboegwu and Okonkwo (2012) study indicates a significant difference in students achievement with respect to location of school and education zones. The study showed that urban schools achieved significantly better than students in the rural schools did. Another research by Oworye, J.S. (2011) showed that there is a significant difference between the academic achievement of students in rural and urban secondary schools as measured by senior school certificate examinations. Oworye observed that, uneven distribution of resources, poor school mapping, facilities and problem of qualified teachers refusing appointment or not willing to perform well in villages, lack of good road, poor communication and geographical location of schools has a significant influence on academic performance of students. Zachariah (2012) share that distance to school together with school discipline; family background and school location caused truancy (attendance irregularity) among school students. Distance in association with location of the school seems to be one of the strong influencing origins for poor academic performance among students.

A comparison of the performance on standardized tests of students carried out by Alokan & Arijesuyo (2013), from small, usually rural, schools with those from larger, often

urban, schools concluded that secondary school students from rural environment perform as well as students from urban environment. All things being equal, rural students do not suffer disadvantage simply as the result of their residence in rural areas or their attendance at rural schools. Rural students should be rest assured that they can make it academically in their rural environment, if they are serious with their studies. Parents and students should not feel that one must attend metropolitan school in order to achieve success. Schools are established for the purpose of teaching and learning. It is also more important that the teachers and learners are properly accommodated to facilitate the teaching and learning that go on there. This is the essence of the school plant and facilities (Alimi 2012). Boarding school is a school where students are provided with accommodation to live in school hostel within the environment of the school during school term, or it is a school completely placed in a new surroundings with unfamiliar people and circumstances. Time spent with family and friends from home becomes limited, which make the transition seem harder. Boarding schools could be full boarding or the mixture of both boarders and day students that attend the institution by day and return to their different houses after school hours. The explicit goal of these boarding schools is to substitute time at school to time at home, under the presumption that this will generate better outcomes for students. However, very little is known on the effects this substitution actually produces. Curto and Fryer (2014).The study of Elisha and Daniel (2015) revealed that students who studied through boarding schools outperformed their colleagues who studied Mathematics through non boarding schools. The study concluded that the differences in performance were due to the better study atmosphere at boarding schools. The students at boarding schools also had adequate resources and time for study without the burden of extra household duties at home. According to Ngeno, Nnose and Ayodo (2012), parents and guardians lack guiding principles on making informed decisions on the choice of schools amid limited financial resources. Ngeno, Nnose and Ayodo revealed that boarding schools gradually attain the status of providing systemic and quality education that can better students' academic performance.

Day schools are educational institute where children (or higher - age adolescents) are giving instruction during the day, after which the students return to their homes. Or it is a school where all the students go for studies and return to their homes after school hours. According to Basuki (2013), in the full-day school, most of the time is used for learning

programs with an informal atmosphere, not stuffy and fun for students. As the consequence, it requires creativity and innovation of teachers. In this case, Basuki relied his argument based on a study stating that the affective learning time for children was only 3-4 hours a day (in a formal setting) and 7-8 hours a day (in an informal atmosphere). Thus, the full-day school is the system where the components are arranged in an orderly and well to support the process of human maturation (learners) through teaching and training efforts in longer school time compared to schools in general. Day School implements a basic concept of "Integrated-activity" and "Integrated-Curriculum". This is the key that distinguishes it to schools in general. In day school, all programs and students' activities in the school i.e. learning, playing and worshipping are packaged in an educational system. Kosgei and Keter (2016). Indicated that boarding schools have more hours for learner's private studies both in a weekday and in a weekend. Boarding school on average had 4. 2 hours in a weekday and 6.5 hours in a weekend, while day schools learners had 2.3 hour and 2.1 hours respectively. There is, therefore, a clear difference in time available for learner's private studies between learners in boarding and day schools, learners in boarding schools, have more time for private studies compared to those in day schools. Study time is used for doing homework, revising for examination and discussion. In the above situation learners in day schools are disadvantaged as they have little time if any, this combined with other factors could be attributed to relatively low performance among learners in day schools.

Both boarding and day schools could either be privately or publicly owned

According to Abimbola (2013), "The system of education in Nigeria provides little opportunities for students to engage in self instruction because they are always being taught by either teachers in schools or coaching classes, or parents and siblings at home, without knowing how to study by themselves, with the exception of, perhaps, students in boarding schools"(page 36). Therefore, all students should be encouraged to imbibe good reading culture which would in turn inspire their learning interest in Mathematics.

The performance of students in any academic task has always been of special interest to educators,' parents and society at large. The primary concern of any educator who is entrusted with the responsibility of selecting students for any advance training programme in a given field is the ability to estimate as accurately and as early as possible the probability that such candidates will succeed or fail. There is widespread interest in improving the level of Mathematics performance in schools. Apart from the economic benefits of better preparing

young people for the numeracy demands of modern work place and raising the overall skill levels of the work force, there are also social benefits tied to improving access for larger numbers of young people to post- school education and training opportunities and laying stronger foundation to skills for lifelong learning. This was the main reason the research considered the four content of algebra, trigonometry, geometry and statistics because of their importance in every individual's life. The interest in raising levels of performance has led to a focus on identifying the range of factors that shape performance as well as understanding how these factors operate to limit or enhance the performance of students by gender. (Sylvia, Francis & Lucas 2011).

(Alimi, 2012), reported the mass failure across the 36 states of the federation, in West African Senior School Certificate Examination (WASSCE) and National Examination Council (NECO) 2009 as indicated in table 1 page 63. In August 2010, WAEC gave the outcome of the May/June 2010 exercise as achieving a 65 percent failure in English Language and Mathematics sitting alone. That report further showed that only 34.95 percent of the candidates who sat for the examinations, made five credits, including English Language and Mathematics, representing 337,071 of the 1,278,843 candidates whose results were released by the examination body (WAEC,2010). The WAEC Nov. /Dec. 2010 WASSC examination result in English and Mathematics, two subjects widely believed to be the pivot of the major fields of sciences and arts, was also nothing to write home about (Adeiza, 2011). The failure was not just intense; it was truly hopeless in the sense of the situation in the post-primary training environment. In this case and as earlier declared on December 23, 2010 by the examinations body, only 20.04 per cent or 62,295 candidates obtained credit pass in English, Mathematics and other three subjects in the Nov. /Dec. 2010 examinations. Also table 1 & 2 showed the result of WASSCE from 1991 to 2016, which indicated mass failure of students across the country with an exception of 2012. This is a pointer to the fact that all is not well with the students' attainment in the cognitive domain. The consequence of mass failure in public examination is the inability of learners to proceed to higher educational institutions.

The issue of academic performance of students is of great importance to every concerned parent. This is because the level of academic performance of any child goes a long way to determine the child's future career. Many variables may be held responsible for either good or poor performance of children in the school. Poor academic performance has become

a common characteristic of the educational system in Nigeria. (Onoyase, 2015). The factors responsible for either good or poor academic performance may include gender, the nature of the school location and school type. The investigation of Onoyase, (2015), has established that there was a significant difference among students in urban and rural secondary schools in their academic performance in Mathematics. The difference in academic performance among the students may be due to the concentration of more qualified Mathematics teachers posted to the urban secondary schools as against those in the rural areas.

Mathematics is the foundation of all sciences, a compulsory subject in all Nigerian schools, and followed by the worrisome trend in poor performance in public examinations as indicated by West African Examination Council (WAEC), from 1991 to 2016. This study has examined the influence of gender, school location and school type on students' academic performance in four mathematics content areas in senior secondary II students in Adamawa state. The four content areas are; algebra, trigonometry, geometry and statistics. The multi-pronged study, seeking performance by gender, school location and school type used a validated Mathematics Performance Test to assess the students in the four content. Based on the importance of mathematics in national development as previously discussed and the subsequent poor performance of student in mathematics, in has been a source of concern for the researcher to choose the four mathematics curriculum content areas, due to their importance in day to day teaching/learning.

1.2 Statement of the Problem

Education is generally regarded as a major indicator of a community's social well-being, standard of living and social justice. Education is a powerful instrument of developing intellectual abilities of shaping cultural attitudes and acquiring knowledge and skills, both directly and indirectly. Education is therefore, important for acquiring social well-being because of its close association with other factors of social well-being. (Aloka & Arijesuyo, 2013).

The stakeholders in education including parents are worried about the poor performance in Mathematics as a whole. Investigation had shown that students in secondary schools are not very much interested in Mathematics even though they are aware of the benefits therein. Nigeria philosophy and goals of education section 2 was to inculcate

permanent literacy, numeracy and ability for every citizen (Nigeria National Policy on Education-World Bank Group, 2013). Therefore, based on the integration of an individual into sound and effective citizen and equal educational opportunities in Nigeria, Adamawa State believes in the objective of building a just and egalitarian society and shares the desire that each part of the whole should progress economically, educationally and socially as other parts. This can be achieved through good performance in Mathematics in the Senior Secondary schools. From the foregoing submission, it is pertinent that several factors contribute to the poor performance of students in Mathematics in the senior secondary classes. Gender, school location, and school type have been identified as some of the factors that can influence students' academic performance in mathematics.

There is need to actually find out if there is any differences in students' academic performance in the four Mathematics curriculum content areas (algebra, trigonometry, geometry and statistics) based on gender, school location and school type. There are many contents areas in mathematics, but the researcher choses these four content areas because of their importance and diversity in Life. Every individual need algebra to be able to count, add, share, subtract and group things. The knowledge of geometry and trigonometry is very important in sciences and technology which is the bed rock of every developed nation. While every individual need the knowledge of statistics to able to collect, analyse, predict, interpret, present and organise data. With all the importance attached to Mathematics, it has been observed that students' academic performance in Mathematics is becoming worse in public Senior Secondary Schools. Many parents prefer to enroll their children in private schools where better academic performance is guaranteed for their children. It also appears that some parents believe that their children cannot perform very well academically in co-educational school (mixed schools). To this end, many of them would prefer to register their children in single sexed schools for Senior School Certificate Examination to enhance better academic performance in Mathematics. Many parents believe that the academic performance in rural schools is poor compared with academic performance of students in urban schools and therefore enroll their wards in urban schools for Senior School Certificate Examinations (SSCE). It is against this background that the study investigates the influence of gender, School location and School type on students' academic performance in Senior secondary schools in Adamawa State.

1.3 Purpose of the Study

The purpose of the study was to determine whether there are differences in students' academic performance among public Senior Secondary II students in Mathematics based on gender, school location and school type in Yola and Gombi education zone of Adamawa State, Nigeria.

The specific objectives are to;

i. Determine the mean scores in academic performance of senior secondary II students in Mathematics based on gender.
ii. Determine the mean scores in academic performance of senior secondary II students in Mathematics based on school location.
iii. Determine the mean scores in academic performance of senior secondary II students in Mathematics based on school type.
iv. Determine the mean scores in academic performance of senior secondary II students in Mathematics based on gender, school location and school type.

1.4 Research Questions

1. What are the mean scores of senior secondary II students' in Mathematics based on gender?

2. What are the mean scores of senior secondary II students' in Mathematics based on school location?

3. What are the mean scores of senior secondary II students' in Mathematics based on school type?

1.5. Hypotheses

The following null hypotheses were formulated to guide this study and were tested at 0.05 alpha level of significance.

$H_{01:}$ There is no significant mean influence in academic performance of senior secondary II students in Mathematics based on gender.

$H_{02:}$ There is no significant mean influence in academic performance of senior secondary II students in Mathematics based on school location.

H_{03}: There is no significant mean influence in academic performance of senior secondary II students in mathematics based on school type.

$H_{04:}$ There is no significant influence of gender, school location and school type on the academic performance of Senior Secondary II students in Mathematics based on gender, School type and School location.

1.6 Significance of the Study

The findings of the present study would be useful to classroom teachers, curriculum planners, students, School owners, managers, guidance and counselors, Govrnment, educational planners, researchers and parents. For teachers they may be better informed on how to help and guide their students on better ways of delivering and assessing assimilation of different content areas in mathematics. The teachers would also engage students to ascertain which part of the content they have difficulties in.

The findings of this study, if discussed in workshops and seminars would guide school owners, managers, and especially guidance and counselors on the imperative of student –student classroom interactions between the sexes and teacher-student classroom interactions in different types of schools settings. The result of this study would serve as a guide to parents in the choice of school for their wards and debunk the pre-formed opinions on school types in relation to academic performance. It would also guide governments at different level on the type of input that would be required to achieve the sustainable development goals in the areas of science and technology and gender in equality.

It was anticipated that the findings of this study may give educational planners new insights in formulating educational policies that are equal and fair in terms of gender and school location. Students were also expected to benefit from the findings; because improved mathematics performance will give them opportunities to pursue science related courses in higher institutions of learning and middle level colleges.

The result of this study would be of benefit to students in selection of school type and school location. It may also encourage the female students to put more efforts in Mathematics, as gender has nothing to do with performance in mathematics. Other researchers may use this study as a basis for their studies which may be done elsewhere. It may also increase the body of knowledge and fill research gap(s) in literature in this area.

1.7 Scope of the Study

The study was delimited to public Senior Secondary School II students in Yola and Gombi Education Zone of Adamawa state, Nigeria. The four content areas are; algebra, trigonometry, geometry and statistics. The multi-pronged study, seeking performance by gender, School location and School type used with a validated Mathematics Performance Test to assess the students in the four contents. Based on the importance of Mathematics in national development as previously discussed and the subsequent poor performance of student in Mathematics, in has been a source of concern for the researcher to choose the four Mathematics curriculum content areas, due to their importance in day to day teaching/learning.

1.8 Operational Definition of Terms

The following terms were defined in terms of the context in which they were used in this study.

Academic Performance: Scores obtained by the students after conducting the test on selected mathematics content areas that was used in the study.

Gender: Refers to the student in the study being male or female.

School Type: Refers to either boarding or day schools.

School Location: Refers to urban or rural schools.

Urban schools: Are schools in towns.

Rural schools: Are schools outside towns.

CHAPTER TWO

LITERATURE REVIEW

This chapter discusses the review of related literature under the following sub-headings:

2.1 Theoretical Framework.

2.2 Concept of Academic Performance.

2.3 Students' Academic Performance in Mathematics.

2.4 Concept of Gender.

2.5 Gender and Academic Performance in Mathematics.

2.6 Concept of School Type.

2.7 School Type and Academic Performance in Mathematics.

2.8 Concept of School Location

2.9 School Location and Academic Performance in Mathematics.

2.9.1 Review of Related Empirical Studies.

2.9.2 Summary of Literature Review and Uniqueness of the study.

2.1 Theoretical Framework

The theoretical framework adopted for this study was the Skinnerian environmental theory and Social Learning Theory by Albert Bandura (1977). The theory of B. F. Skinner (1917) was proposed on operant conditioning. The idea that learning is a function of change in overt behaviour. ‘‘Changes in the behaviours are the result on an individual’s response to event (stimuli) that occur in the environment”. The idea that behaviour is determined by its consequences, be they reinforcements or punishments, which make it more or less likely that the behaviour occur again. The environmental approaches conceive human behaviour as something that is acquired through the process of interaction with the environment, rather than inherited. According to this theory, behavioural development is controlled by and is a function of the physical and psycho-social environment. Children’s development is believed to be shaped by the pattern of reinforcement they receives from the environment. Learning is manifested by a change in behaviour, and the environment shapes behaviour. Therefore learning is the acquisition of new behaviour through conditioning. It has been observed that sometimes children develop new behaviour by observing other people’s behaviour and by observing the reinforcing or punishing experience of others.

Albert Bandura’s social learning theory posits that people learn from one another, via observation, imitation and modelling. The theory has often been called a bridge between behaviourist and cognitivist learning theories because it encompasses attention, memory and motivation. The theory emphasizes the importance of observational learning which occurs when the behaviour is influenced by watching the behaviour of a model. It is the consequences of the mode’s behaviour that determines the behaviour of the observer. The common objects in our environment which children usually adopt as models include stars in the class, school teacher. Bandura listed four processes involved in observational learning, intentional, retention, production and motivational processes. He emphasized that social learning is interactional in nature.

Bandura also stressed that human learning involves the interaction of the person, the person’s behaviour and the environment. It is not worthy that a child’s progress in the school is influenced by the attitude he develops towards not only the subjects he is to learn but also the school and the school milieu, hence his attitude will depend on the sort of experience he

has had. Based on the underlining principles and assumptions guiding the above discussed theories, the current study was therefore, being anchored on the Skinner's environmental theory and Bandura's social learning theory. The two theories are related to the study in the sense that school location and school type exist in an environment that can affect learning positively or negatively. Also when the behaviour is reinforced or retained as a result of learning possibility the behaviour is enhance and if punishment occurs, the behaviour may not be repeated.

2.2 Concept of Academic Performance

Kaggwa, (2003) explained academic performance as the quality and quantity of knowledge, skills, techniques and positive attitudes, behaviour and philosophy that students achieve. The World Bank (2002), further observed that this performance is evaluated by the mark or grade that students attain in tests or examinations done at the end of the topic, term, year or educational cycle. Hence, the quality of the grades and the number of students that pass with various grades determine the level of academic performance. Academic performance is therefore, a concern of people who have vested interest in schools. They may include parents, students, teachers, proprietors, stakeholders of education and the entire society that forms the school as a community. Unless all stakeholders are involved, school achievements including students' performance may not be realized (Dervitsiotis, 2004).

Academic performance is the outcomes that indicates extent to which a person has accomplished specific goals that were the focus of activities in instructional environments, specifically in school, college and University. Academic performance is considered to be a multifaceted construct that comprised different domains of learning. Because the field of academic performance is very wide, it covers a broad variety of educational outcomes; the definition of academic performance depends on the indicators used to measure it. Among the many criteria that indicate academic performance are procedural and declarative knowledge acquired in an educational system.

2.3 Students Academic Performance in Mathematics.

According to Duruji (2014), academic performance refers to the degree of a student's accomplishment in his or her tasks and studies. The most well-known indicator of measuring

academic performance is grades which reflect the student's "score" for their subjects and overall tenure. Success is measured by academic performance in most educational institutions.

Despite the recognition accorded to mathematics due to its relevance, Elekwa (2010) remarked that students exhibit non-chalant attitude towards mathematics, even when they know that they need it to forge ahead in their studies and in life. Such students who have already conditioned their minds that mathematics is a difficult subject are usually not serious in the learning of mathematics and therefore perform poorly in mathematics tests and examination. Analysis of school certificate mathematics examination results shows that students' performances in mathematics are consistently poor.

Uwadiae, (2010), find out that less than 25% of registered candidate in SSCE 2008 obtain credit pass in Mathematics. Even the SSCE results released by WAEC for 2009 indicated poor achievement of students in mathematics as shown in table 2 on page 50. Olunloye, (2010), reported that the ugly trend of high failure rate in mathematics is a national disaster. Therefore, feasible ways of improving the performance has remained an area of great concern for researchers.

Table 2 on page 64 shows the percentages of students who passed at credit level (A 1 - C6), those who had ordinary pass (P7 and P8) or fail (F9) in Mathematics for the period 1999 to 2016. This clearly indicates that the number of students who failed or had ordinary pass in the examination for the given years was consistently very high as compared to those who passed at credit level. This also confirmed the problem of student's poor performance in Mathematics.

In another development, Zalmon and Wonu (2017), carried out a research on comparative analysis of students' achievement in May/June West African Senior Secondary Certificate Examination (WASSCE) in general mathematics in Nigeria 1991 to 2016. The study shows that the population of students that sat for WASSCE in general Mathematics increased by 147.76% after a period of 13years and that improvement in achievement was significant with time. This report has contradicted Uwadiae, (2010) report. In spite of all these importance accorded to mathematics in the society, there are a lot of public complaints on the

performance of students at the secondary school level in mathematics. Daso, (2013) reported that many students, even as far back as their primary school days did not take interest in mathematics to a meaningful degree; remarking that methods of instruction were not very favorable to these students. The scholar posited that this was due to the paucity of competent and adequately qualified mathematics teachers who were invariably over labored.

Iwuoha (2007) identified lack of thorough grooming in mathematics concepts; unsuitable teaching environment, wrong evaluation techniques by both teachers in schools and WAEC's, lack of incentives to mathematics teachers as major factors that caused low mathematics achievement.

2.4 Concept of Gender

Gender is the range of physical, biological, mental and behavioural characteristics pertaining to and differentiating between masculine and feminity (Haig, 2004). Depending on the context, the term may refer to biological sex (i.e. the state of being male, female or intersex). Sex based social structure (including gender roles and other social roles) or gender identity (Udry, 1994). Gender issues are currently the main focus of discussion and research all over the world. Nigeria inclusive. The question of gender is a matter of grave concern especially among academics and policy formulators. Intellectuals are worried about the role of male and female in the psychological, political, social, economic, religious, scientific and technological development of nations

Meanwhile, concerns about academic achievement with respect to males and females have generated a considerable interest in the field of educational testing over the years. Differences in academic achievement of the two genders are likely to contribute disparities in the allocation of cognitive roles in the world of work.

Numerous studies on sex differences in cognitive performance can be found. Colom and Lynn (2004) asserted that males have larger average brain sizes than females and therefore, would be expected to have higher average IQs. Mackintosh (1998) on the other hand, claims that there is no sex difference in general intelligence. Mackintosh proposes that general intelligence should be defined as reasoning ability and that the best measure of this is the progressive matrices. Examining two tests administered by the Israel Defense Forces

which qualify as IQ tests-one of them is an adaptation of progressive matrices. Flynn (1998) found no sex difference.

2.5 Gender and Academic Performance in Mathematics.

Singh (2010) opines that gender refers to a socio-cultural construct that connotes the differentiated roles and responsibilities of men and women in a particular society. This definition implies that gender determines the role, which one plays in relation to general political, cultural, social and economic system of the society. Gender inequality in education generally and in Mathematics education in particular has remained a perennial global phenomenon (Awofala, 2007). The scholar confirms the portability of male superiority in mathematics virtually at all levels of education, the pre-kindergarten level inclusive.

Oludipe (2012), Kola and Taiwo, (2013) observed in their various studies that there is no significant difference between male and female performance. Saidin &Brahim (2011) in a study carried out in single-sex schools in Malaysia, found out that boys performance in English and foreign languages, and girls performance in Mathematics and science improved in a single gender settings. The study reports the experience of 30 secondary students enrolled in single gender schools. The study reveals that in gender separate classroom, students have higher motivation and higher confidence levels which offer them better educational opportunities. In girl-only learning environments, girls are exposed to more successful female role models. The top students in all academic subjects and the leaders in sport and extra-curricular activities are girls. In general, they feel better about their bodies and their body image as well as about their academic abilities. By promoting self-esteem, single-sex schools may better equip girls to fight for their human rights in gender-biased male-dominated societies (Sullivan, Joshi & Leonard, 2010).

In British schools, they examining the impact of single-sex schooling found out that single sex schooling is linked to the attainment of gender stereotyped subject areas for both sexes, not just during the school years, but also later in life. The positive effects of single-sex schools remain substantial, even after taking into account various school-level variables such as teacher quality, the student-teacher ratio, the proportion of students receiving lunch support, and whether the schools are public or private(Park, Behrman & Choi, 2012).

Despite comparable performance by women and men in a variety of Mathematics subjects such as algebra and geometry and similar abilities associated with completing mathematics-related tasks, female interest in Mathematics is markedly lower than male interest (Amelink, 2012). At a young age girls and boys express similar interest in and positive attitudes toward mathematics. However, gender differences in Mathematics interest become apparent after elementary school. By eighth grade, boys are more likely than girls to indicate an interest in Mathematics. Between fourth and twelfth grades, the percentage of girls who indicate they are no longer interested in studying Mathematics increases from 9% to 50%. A large scale study in the U.S.A. by Hydea and Mertzb (2009) revealed that girls have reached parity with boys in Mathematics performance, including at high school where a gap existed in earlier decades. They affirmed that girls are doing better than boys even for tasks that require complex problem solving.

The impact of gender on students' academic performance in Mathematics remains an area of research interest (Forgasz and Rivera, 2012; Atnafu, 2011; Ahmed and Bora, 2011). These studies, reported that gender differences in Mathematics still existed and that male students were more positive towards mathematics learning. However, another recent contradicting research by Vale (2012), reports that the gender gap in Mathematics achievement was closing up. This contradiction stimulates the need for further studies on gender disparities in Mathematics teaching and learning.

2.6 Concept of School Type

The school can be defined as an industry engaged in the transformation of human being, ready for meaningful living and making his or her own contribution to the development of the society. For the school to achieve this role, they will not work in isolation, It is on this ground that the school is referred to as a social system where the different unit need to work together to achieve a common goal. Or it is an institution for educating people (Ikegwuru, 2011).

There are many types of schools, but the study considered only boarding and day schools. Boarding school is a school where students' lives on campus in dormitories or hostels. They only go home during the vocations. Whereas, day school is an educational

institution where students are given instruction during the day, after which the students return homes for everything else. Adetunde and Asare (2009), conducted a study in Ghana and reported that, there was no significant difference between a student been a boarder or day student in terms of performance in Mathematics. There are some boarding students who will not study because there is no control over them. There are however day students who will have no choice but to sit behind their books and study because their parents say so. The role of parents on day students is a factor for the insignificant difference in their performance otherwise boarding students should have done better than the day students.

According to Elisha and Daniel (2015), students who studied through boarding schools outperformed their colleagues who studied Mathematics through day schools. The study concluded that the differences in performance were due to the better study atmosphere at boarding schools. The students at boarding schools also had adequate resources and time for study without the burden of extra household duties at home. Other causes of differences in performance between boarding school students and day scholars is the distance travelled between home and school on a daily basis as noted by Coady and Parker (2004), cited by Elisha (2015). Day scholars were found to have been negatively affected by the distance in terms of their energy levels and level of concentration in class. Coady (2004), concluded that there was a positive correlation of the study materials and better performance at home in rural areas. The study, however, reported that children who studied from home did not have adequate study materials.

2.7 School type and Academic Performance in Mathematics.

Schools are established for the purpose of teaching and learning. It is also more important that the teachers and learners are properly accommodated to facilitate the teaching and learning that go on there. The performance of students in any academic task has always been of special interest to educators' parents and society at large. The primary concern of any educator who is entrusted with the responsibility of selecting students for any advance training program in a given field is the ability to estimate as accurately and as early as possible the probability that such candidates will succeed or fail. The quality of school depends on inputs in terms of human and material resources. School type refers to boarding, day, and private/public, coeducational or single sex schools. It is an important factor to be considering in this study.

2.7.1 Boarding System and Academic Performance in Mathematics.

Boarding school is a school where students are provided with accommodation to live in school hostel within the environment of the school during school term. Boarding schools could be full boarding or the mixture of both boarders and day students that attend the institution by day and return to their different houses after school hours. Boarding schools can either be privately or publicly owned.

According to Ngeno (2012), parents and guardians lack guiding principles on making informed decisions on the choice of schools amid limited financial resources. Ngeno revealed that boarding schools gradually attain the status of providing systemic and quality education that can better students' academic performance. The boarding schools system, gradually attain the status of providing systemic and quality education that can better students' academic performance. Abimbola (2013), reported that the system of education in Nigeria provides little opportunities for students to engage in self instruction because they are always being taught by either teachers in schools or coaching classes, or parents and siblings at home, without knowing how to study by themselves, with the exception of, perhaps, students in boarding schools.

Mulkah (2017), indicated that boarding and day school students in Owo, Ondo state have performed equally in biology and significant difference does not exist between the

performance of boarding and day secondary school students in biology. The researcher further stated that there is significant difference between the performance of students in males' only and females' boarding schools in biology. There exist significant difference between the two variables tested; male mixed boarding school and female mixed boarding schools. According to Michael as citied in Titus (2010), boarding schools have three terms with in 12 months, approximately thirteen weeks each, with a few days half term holiday during which students are expected to go home. Boarding students nowadays often go to school within easy travelling distance of their homes, and so may see their families frequently. Boarding are forms of residential schools, however, not all residential schools are classic boarding school.

2.7.2 Single Sex School and Academic Performance in Mathematics.

Males and females in view of their biological structures are naturally different. While males are physically strong, the females are weaker and this sometimes creates poor patronage in physically demanding careers by females, (Awofala, 2008). Certainly, many more males than females are in engineering, medicine or any science-related careers which are physically demanding and use advanced Mathematics beyond Arithmetic. Craig (2011), in a study reported that single-sex environments help to reduce gender stereotypes students' encounter in coeducational settings. Opponents of single-sex instruction believe that accomplishments achieved in single-sex environments can be achieved in coeducational environments if the proper teaching strategies were in place. Single-sex environments are better than coeducational environments. In another development Guarisco (2010) reported that single-sex schools would actually benefit boys the most–specifically, boys from minority groups and boys from poor families who may need more direct guidance. The researcher noted that in public school single-sex environments, student achievement improves, especially for minority students or students in poverty, because of improved behaviors and teacher focus on learning-style differences. According to the researcher, females also benefit from single-sex environments. Sexual harassment is an unfortunate problem in coeducational environments. While the risk is still present in single-sex schools, some feel that the single-sex environment provides a safer environment for female students. Single-sex schools cannot adequately prepare students for the real world. The National Organization for Women

(NOW) and the American Association of University Women (AAUW) worry that separating children by sex is similar to separating them by race.

Girls sometimes face challenges such as lower learning and engagement in science and technology classes; relational aggression in school and in cyberspace; and problems with self-esteem development in adolescence. In March 2010, The Centre on Education Policy in Georgia examined state test data from all age groups in all 50 states and found good news for girls but bad news for boys. In mathematics, girls are doing roughly as well as boys, and the differences that do exist in some states are small and show no clear national pattern favoring boys or girls. However, in reading, boys are lagging behind girls in all states with adequate data, and these gaps are greater than 10 percentage points in some states (Chudowsky & Chudowsky 2010). Gerald (2011), indicated that female students educated in single-sex classes, as compared to female students assigned to coeducational classes, evaluate their mathematics skills more positively and are more likely to attribute their performance in mathematics to their own efforts rather than to exogenous talent or luck.

According to Musibau (2010), school sex had no significant influence on students' academic performance. This finding implies that whether a student attends single sexed school or mixed sexed school does not make a difference in his academic performance. The finding contradicts the assumption of many parents that enroll their wards in single sexed schools on basis of better academic performance. The contradictory findings in respect of influence of school sexed on students' academic performance could be attributed to variation in factors influencing students' academic performance such as teacher job commitment, teacher qualification, availability of school facilities and students' intelligent.

2.7.3 Day School System and Academic Performance in Mathematics.

Day school is a school where all the students go for studies and return to their homes after school hours. Day schools can either be privately or publicly owned. According to Zakariya as cited in Titus 2010, the history of phasing out boarding schools to that of de-boarding system came into effect as a result of the Government inability to provide a standardized system of education. Titus stated that failure of Government in the context cannot be divorced from the economic problems the country (Nigeria) in general and

Adamawa State in particular was facing because the Government alone will not be able to take the responsibility of providing equipment, facilities, books as well as feeding and accommodating secondary school students which is increasing every day.

2.7.4 Private / Public School and Academic Performance in Mathematics.

Public and private schools differs in the administration and conditions for teaching and learning. Public schools are fully dependent on the state for their finances and their administration, private schools depend more on student fees and private charity and only occasionally on the state for additional support. Public schools were established to make education universally available to all children, free of charge. This mission remains as necessary today as it was many years ago. Public schools are accessible in all parts of the country, including areas where few or no private schools exist. Private schools, though important to many families, were not designed to be a universal system. Private schools, though important to many families, were not designed to be a universal system. Public schools have been the main institution in American and even in Nigeria. Igbinedion and Epumepu (2011), carried out a study on comparing students' academic performance in business studies in public and private Junior Secondary School Certificate Examinations (JSSCE) in Ovia South West Local Government Council Area of Edo State, Nigeria. It was revealed that there was significant difference in the academic performance in business studies between the public and private schools from 2008 to 2011. Results further showed that the percentage performance trend of public schools were higher than those of the private both males and females.

Private secular secondary schools provide a more valuable education than public secondary schools. Private schools look stronger on observable measures and are widely perceived as superior, (Okon & Archibong, 2015). Adewale, (2010) states that one of the measures of school effectiveness that has stood the test of time is student's achievement. Private schools in Nigeria began getting a strong foothold as governance structures began to depreciate in the early 1980s. Private schools were to provide an educational option so attractive that students and parents would be drawn to it voluntarily, reducing the need for compulsory enrolment into public schools. Private schools are in theory characteristically and economically diverse, and offer curricular or instructional innovation or opportunities to

draw in students. Conceptually, private schools have an underlying assumption that aligning students' interests to their studies and exposing them to more diversity will improve academic performance. Although numerous studies have examined whether school type or competition results in improved academic performance (Esposito, 2010; Rouse & Barrows, 2008), the results are mixed, with some studies finding improvements and other studies finding none, regardless of school type and gender.

2.8 Concept of School Location

School location refers to the particular place, in relation to other areas in the physical environment (rural or urban), where the school is sited. In Nigeria, rural life is uniform, homogenous and less complex than that of urban centres, with cultural diversity, which often is suspected to affect students' academic achievement. This is because urban centers are better favoured with respect to distribution of social amenities such as pipe borne water, electricity, healthcare facilities while the rural areas are less favoured. This is also true in the distribution of educational facilities and teachers. These prevailing conditions imply that learning opportunities in Nigerian schools differ from school to school. (Joseph & Emmanuel, 2017). It would appear therefore that students in Nigerian urban schools have more educational opportunities than their counterparts in rural schools have. While some studies have shown positive influence, others have shown negative influence of school location on the students' learning outcome or achievement. Joseph (2017), found that location was significant in learning aspects of Mathematics and basic science that involve angles, with rural students exhibiting more learning difficulties than their urban counterparts do. Ahiaba and Igweonwu (2003) investigated the influence of school location on the performance of Mathematics and basic science students in rural and urban schools at the SSC examination and found that Mathematics and basic science students in urban schools performed better with superior grades, than their rural counterparts while failure rate was higher in the rural schools. Some studies (Bosede, 2010) showed no difference in academic achievement of students because of location. Others showed that rural students performed better on practical skills in Mathematics and basic science than their urban counterparts did. Gana (2007) showed that there is no difference in performance of students because of

location. Location here is in terms of whether the place of study or school is sited in rural or urban community.

2.9 School Location and Academic Performance in Mathematics.

Location of a particular school all around the world is conducted with a view to ensure that effective teaching and learning process would take place. School Location in this study was considered as either in urban or rural areas. Many parents believe that the academic performance in urban schools is poor compared with academic performance of students in rural schools and therefore enroll their wards in the rural schools for Senior School Certificate Examinations (SSCE). It appears most of the public secondary schools cannot compete favourably with Government Colleges (State Unity colleges) in terms of students' academic performance as a result of their inefficiency, (Musibau, 2010). (Goodpaster 2012), reported that, teacher recruitment and retention is reported to be a problem for rural schools, with greater issue in the recruitment of specialist staff, such as those with science and mathematics qualifications. The researcher added that, rural specialist teacher retention rates are affected by the isolation of the school, access to continued professional development, and limited numbers of other specialist teachers. Steel (2007) identify lower funding in rural schools for educational resource. The decreased rates of funding are implied to affect the quality of rural teaching, with less access to appropriate resources and teaching materials, and fewer funds to attract higher quality teachers with specialist knowledge in mathematics. Teacher perceptions toward limited teaching materials in urban and rural schools show a disparity, with rural schools facing a greater impact. Sulivan (2013), in recent research an effect of teaching materials on student learning has been noted with teachers in small rural community schools reporting that a shortage of science laboratory equipment hinders student learning by 33.3%. This compares to teachers in perceptions large town schools, city schools and schools close to city centres reporting 10.3%, 20.4% and 13.5% for effects on student achievement in United Kingdom. Future aspirations towards careers in science and Mathematics may affect students' achievement. Rural schools lack the experiences and role models in their community which enables them to see a career path in a science or mathematics related role, (Boynton, 2013). The potential role models younger students are claimed to look to are young college graduates. However,

graduates tend to stay in urban cities, where more job opportunities lie, meaning rural students are not exposed to science and mathematics related careers (Boynton, 2013). Okolosi (2007) investigated the difference in academic performance between urban and rural students in junior secondary schools in Udu local government area of Delta State and found out that there is no significant difference between urban and rural students in their academic performance in English Language and mathematics as well.

Onoyase, (2015), found out that there is a significant difference among students' urban and rural secondary schools in their academic performance in mathematics. The difference in academic performance among the students may be due to the concentration of more qualified mathematics teachers posted to the urban secondary schools as against those in the rural areas. This contradict the study of Musibau (2010), that school location had no significant influence on students' academic performance. This finding implies that whether a student attends rural or urban secondary school it does not make a difference in his/her academic performance. (Alokan, 2013), concludes that secondary school students from rural environment perform as well as students from urban environment. All things being equal, rural students do not suffer disadvantage simply as the result of their residence in rural areas or their attendance at rural schools. The old rural deficit model could be discarded as educators take a new, more objective look at the performance of the many different types of rural students. A rural deficit model could be replaced by a rural strength model. Such a model is suggested by the fact that rural students do wish to attend higher institutions and make good grades.

Jebson and Wamdeo, (2014), conducted a study on differential students' academic performance in junior secondary school three mathematics curriculum content areas based on gender, school type and school location, and reported that the students in the urban schools performed better in all the three content areas of mathematics studied. The educational implication of this finding shows that school location (urban/rural) played a major role. Thus further study needs to be done.

2.9.1 Review of Related Empirical Studies.

There is no conclusive evidence in literature to show that Mathematics performance of males are better than the females, nor students in the urban, rural, boarding or day performance better than others. Adeyinka and Kaino (2012), reported quantile analysis of the Mathematics achievement – attitude relationship by gender. The finding of the study was on attitude and Mathematics achievement at the senior secondary school level in Botswana. New methodology was adopted in the analysis of the relationship between attitude, gender bias and achievement in Mathematics with gender as a dummy variable. The study adopted the quantitative design and the researchers collected data using a Mathematics test and a questionnaire. The target population was senior secondary school students in public and private schools in Botswana. The sample involved only Form 5 students selected from 5 private and 4 public senior secondary schools in Gaborone city – the capital of Botswana. The random sampling technique was used to select 2 schools from each of the school categories. After the random selection of the schools, convenience sampling was used to select the students from the schools. Twenty (20) boys and 20 girls from each school were targeted and at the end of the process, the responses from a total of 156 respondents were analyzed. The constructed achievement test intended to measure students' cognitive knowledge of Mathematics. The result shows positive attitude significantly influenced the Mathematics performance of students in the OLS model but was not significant at the 95th percentile in the QReg. The result implies that at the uppermost tail of Mathematics performance, there were some other variables that better explained Mathematics achievements. Furthermore, using this method, gender bias and female factors did not influence achievements significantly. The researchers hoped that the findings would open up a new research frontier by encouraging researchers to study the Mathematics performance-attitude relationship at the quartiles rather than generalizing the relationship across all levels of students' ability. The above study is relevant to the present study in the area of gender and Mathematics performance of senior secondary school students. The difference with this study is students' attitude.

Ato and Adelaide (2015), conducted a research on gender differences and Mathematics performance of senior high school students: a case of Ghana national college. a quasi-experimental research was used to find out differences in Mathematics performance

of students using performance assessment (PA) driven instructions at the senior high school level at Ghana National College in Cape Coast. Two Form 1 science classes were used for the study and were assigned as experimental and control groups. These two classes were randomly chosen for the study. The experimental group consisted of forty-two students and the control group forty students. Data was collected through the use of an open ended test in Mathematics. The independent sample t-test and paired sample t-test were used to find the differences between the groups. The experimental group differed significantly on the post-test scores from the control group. The study identified that PA driven instruction improved students' problem-solving abilities and showed no bias among gender. It is recommended that Mathematics teachers use PA-driven instructions and performance assessment task in their Mathematics lessons. This study investigated gender difference and Mathematics performance of senior high secondary students in Ghana National College while the ongoing study looked at Influence of gender school location and school type on students' academic performance in Mathematics. The two studies are related in the area of academic performance and gender in Mathematics.

Adeneye (2011) carried out a study, on gender as a factor in mathematics performance among Nigerian senior secondary students with varying school organization and location? The mathematics performance of graduating senior secondary year three students over a period of 10 years was investigated for possible gender differences. Data were drawn from students' (880 males and 900 females) mock examination mathematics results from eight secondary schools (2 rural schools, 2 urban schools, 2 single-sex schools and 2 coeducational schools) in south-eastern part of Nigeria. The independent t-test analysis of significance revealed a significant effect of gender in mathematics performance among the sample data. There were significant differences in the mathematics performance of single-sex male and female students and rural male and female students, all in favor of male students. As a result of the findings, the study recommended among others that more co-educational secondary schools be established to engender healthy rivalry between the male and female students in mathematics education since co-educational schools have the tendency to mitigate the performance gap between male and female students in mathematics. The study is relevant to the research under investigation in the sense that, both the two studies are considering

mathematics performance in senior secondary schools based on school location, school type and gender.

Nnamani and Oyibe (2016), carried out a study on gender and academic achievement of secondary school students in social studies in Abakaliki urban of Ebonyi State. The study focused on gender and academic achievement of secondary school students in Social Studies. Two research questions were formulated and the null hypotheses were tested at 0.05 level of significance. The population of the study comprised of three thousand four hundred seventy-nine (3,479) Junior Secondary School II (JSS II) students selected from all the secondary schools in Abakaliki urban of Ebonyi State. The instrument used for data collection was Social Studies Achievement Test (SOSAT), data were analyzed using mean and standard deviation for all research questions, and analysis of co-variance (ANCOVA) was used to test the null hypotheses. The findings of the study revealed that the mean achievement score of female secondary school students was higher than the mean achievement scores of male students. The study also reviewed that there were significant different in the mean achievement of secondary school students in Social Studies based on gender. Based on these findings, the researcher recommended that Social Studies teachers should re-assess their classroom instructional practice because there is a need for them to shift from instructional practice that will give the students equal opportunities to excel in instructional activities. In this case, the study examined gender and academic achievement of junior secondary school students in Ebonyi State of Nigeria, while the present study will be analyzing students' academic performance in senior secondary school based on gender and school factors in Adamawa State. Another area of difference is that the study was considering social studies achievement while the present study is on Mathematics performance.

Alordiah, Akpadaka and Oviogbodu (2015), investigated the influence of gender, school location and socio-economic status on students' academic achievement in mathematics. The study investigated the influence of gender, school location, and socio-economic status (SES) on students' academic achievement in mathematics. The study was an ex-post factor design in which the variables were not manipulated nor controlled. Four research questions and three hypotheses were formulated to guide the study. The stratified random sampling approach was used to sample 1900 students such that the variables in the

study were put into consideration. Mathematics Objective Test (MOT) and Socio-Economic Status Questionnaire (SESQ) was the instrument used. Experts in mathematics and measurement validated the instruments. The reliability of the MOT and SESQ using the test-retest method of establishing reliability yielded 0.71 and 0.70 respectively. The results of the study showed that students have an average achievement in mathematics. Male students performed better than female students, urban students performed better than rural students and students of parents with high SES performed better than students of parents with low SES. One of the recommendations was that teachers should put into consideration the disparities that exist between male/female, urban/rural, and low SES/high SES when teaching mathematics. The study is relevant to the research under investigation in the sense that it examined students' performance in mathematics based on gender and school location.

Jebson and Wamdeo (2014), carried out a study on differential students' academic performance in the junior secondary school three mathematics curriculum content areas based on gender and school factors. The study was to determine the students' academic performance in number & numeration, geometry & measuration, algebraic process and everyday- statistics respectively, based on gender, school type and school location. The study consisted of 3240 Junior Secondary School Students in Borno State 2007/2008 academic session. Random samples of 480 students (240 girls and 240 boys) were used for the study. The instrument used was Competency Skills Test. It was administered on the entire sample. The 3-way General Linear Model (GLM) was used to determine if there was any difference in academic performance of students based on gender, school location and school type. The decision was taken at $P < 0.05$ level of significance. The reliability indices of items were determined using Cronbach's Alpha method. They were found to be 0.74, 0.61, 0.74, and 0.67 for number & numeration, geometry & measuration, algebraic process and everyday-statistics respectively. The results obtained indicated that there were no significant gender differences in academic performance in number and numeration, algebra, geometry and measuration. Data analysis on Everyday – Statistics indicate that that there were significant gender difference in students' academic performance. The researchers recommended that equal distribution of facilities and mathematics teachers to all categories of schools. Teachers are to encourage and treat all students equally in mathematics lesson regardless of their gender as well as proper supervision by the Ministry of Education in teaching –learning

process in both rural and urban schools. This finding is relevance to the study on gender, school type and school location. The major difference from current study is that it was conducted in Junior Secondary School using three mathematics curriculum content areas in Borno State while, the current study will be conducted in Senior Secondary School using four mathematics curriculum content areas in Adamawa State both in Nigeria.

Joseph (2015) conducted a study to determine the extent to which distance affect the academic achievement of students in community secondary schools in Makambako town council. It was guided by four specific objectives, which were carried out through descriptive cross-sectional study design. Data were collected using semi-structured interview guide, questionnaires and documentary review, by involving 12 teachers, two educational officers and 200 (80 boys and 120 girls Student). These respondents were sampled through simple random and purposive sampling technique in which SPSS and inductive analysis procedures were employed to analyze their responses. The researcher determined that longer distance travelled by students to school made them reach schools late and with empty stomachs. Location of school has led to mass failure to most of students, due to long walk among students have cause dropout from school and most of girls' student get pregnancy, thus fails to attain their educational goals. He concluded that, Community secondary schools will continue performing poorly academically if there is no effort done to improve the provision of education to community secondary schools in Makambako town council. This study is relevant to this study under investigation in the area of gender and academic achievement.

Onoyase (2015), carried out a study on academic performance among students in urban, semi-urban and rural secondary schools counselling implications. The study was carried out to investigate the difference in academic performance among students of urban, semi-urban and rural secondary schools in Oshimili South Local Government Area of Delta State Nigeria. Five hypotheses were formulated to guide the study. The researcher collected data on the Senior School Certificate Examination (SSCE) results conducted by the West African Examination Council (WAEC) in the year 2001. The subjects selected for analysis were English language, mathematics, biology, chemistry and geography. Three out of the six secondary schools in the Local Government Area were used for the study. Ninety out of two hundred and twenty students in the three Secondary Schools were used for the study

representing 49.1 percent. One way analysis of variance was used to analyze the data. The study showed that, there was a significant difference in the academic performance among students in urban, semi-urban and rural secondary schools in English language, mathematics, biology, chemistry and geography. This study and the present study are both concerned with academic performance of students' in urban and rural areas. The area of difference is that, this study used five different subjects in the senior secondary school while the present study will be considering four basic curriculum content in mathematics.

Alokan and Arijesuyo (2013) conducted a research on rural and urban differential in student's academic performance among secondary schools Students in Ondo State. This study investigated the difference between the academic performance of students from rural environment and students from urban environment. A descriptive research design of survey type was adopted for the study. The population for the study comprised all public secondary school students in Ondo State. A sample of 240 students was used from six randomly selected schools. A questionnaire tagged 'Academic Performance Questionnaire' was used to collect data. Expert judgments were used to ensure face and content validity. Test-retest method was used to determine the reliability and a reliability coefficient of 0.72 was obtained. Data collected were analyzed by using t-test. The result revealed that there was no significant difference in the academic performance of students from rural environment. Alokan concluded from the result that, all else equal, rural students do not suffer disadvantage in their academic performance simply as the result of their residence in rural areas or their attendance at rural schools. It was recommended; among others that rural deficit model should be further examined as educators take a new and more objective look at the performance of the many different types of rural students. Also, parents and students should not feel that they must attend metropolitan schools in order to achieve success. The study is relevant to this research work in the area of school factors and students' academic performance in mathematics.

Mburu (2013), carried out a study on effects of the type of school attended on students' academic performance in Kericho and Kipkelion districts, Kenya. This study aimed at finding out the effects of the type of school attended on male and female students, academic performance in Kenya. The study used descriptive research design and descriptive statistics

for data analysis and two questionnaires for data collection. The research was guided by the following objectives; to establish whether social classroom interactions affect male and female students' academic performance; Establish whether the type of school attended affect male and female students' academic performance. The major findings of the study were that the type of school attended affected students' academic performance as majority of the girls who qualified to join tertiary institution were from single-sex schools. This study is relevant because it tried to examine effects of school type attended by male and female and the current study is analysing students' academic performance based on gender and school type.

Musibau and Johnson (2010), examined the influence of school sex, location and type on students' academic performance in Ekiti State secondary schools. The study consisted of forty (40) secondary schools. Four government colleges (State Unity colleges) were purposively selected for the study while thirty- six (36) public secondary schools were randomly selected for the study. The school sampled had presented candidates for both West Africa Examination Council (WAEC) and National Examination Council (NECO) respectively. An instrument, school type, sex, location and students' academic performance inventory was used to collect data for the study. Data was analyzed using percentage scores and t- test statistics. Three null hypotheses were generated and tested at 0.05 level of significance. Findings from the study showed that the level of students' academic performance was low. It was also revealed that school type, sex and location had no significant influence on students' academic performance. Based on the finding it was recommended that educational planners, administrators and evaluators should appreciate the fact that the Parent Teacher Association; Guidance and Counselors, philanthropists, students and society at large have crucial role to play in improving students' academic performance and solicit their supports in this regard. This study is relevant to my study on gender and school factors on student's academic performance in senior secondary school. This study and the present study are both concern with influence of school location and type on students' academic performance in secondary school.

Okon and Archibong (2015), conducted a research on school type and students' academic performance in social studies in junior secondary certificate examination (JSCE). School type determines the level of performance in social studies by students at the junior secondary

certificate examination (JSCE). This paper examined the difference in academic achievement of students in both private and public secondary schools in Akwa Ibom State. Research question was formulated to guide the study. The sample size was 940 respondents drawn from both private and public schools. Ex-post factor design was used for this study and t-test analysis was adopted to analyze the data. The findings of this study revealed that students in private secondary schools performed better in social studies than those in public schools. Based on the result, conclusions were drawn, recommendations made and suggestions for further research offered. The study is in line with the ongoing study in terms of students' academic performance and achievement of student in both private and public schools. The study used ex-post factor design for data analysis which the present research will use the same.

Elisha and Daniel (2015), investigated the differences in performance in mathematics between students who study through boarding schools and those who study through non boarding schools in the province of Manicaland. The period that was examined by the researchers was at least ten years after obtaining political independence. The seven districts of Manicaland were compared on ten variables. The researchers used random sampling. In random sampling, as explained by Mulder (1982:57) each member of the population has an equal chance of being selected for the sample. The population was made up of the 248 schools. A random sample of 23 boarding secondary schools was used. A sample of thirty (30) schools was taken from the 225 remaining non-boarding schools using the same random sampling techniques. The thirty schools constituted thirteen percent (13%) of the total population of non-boarding schools. According to Gay (1980) the minimum acceptable sample size statistically is 10 percent of the population. The researcher considered the 65% sample for the boarding schools and 13 percent for the non-boarding schools as adequate.

The study revealed that students who studied through boarding schools outperformed their colleagues who studied mathematics through non boarding schools. The study concluded that the differences in performance were due to the better study atmosphere at boarding schools. The students at boarding schools also had adequate resources and time for study without the burden of extra household duties at home. The study recommended that the Ministry of Primary and Secondary Education, in collaboration with school authorities and parents of

students at non boarding schools provide adequate resources, a conducive study environment after normal school hours and adequate study time for students to improve on mathematics.

Zachariah, George and George (2012). Carried out a research on factors contributing to students' poor performance in Mathematics at Kenya certificate of secondary education, Baringo County, Kenya. The study was to determine the school based factors that affect students' performance in mathematics in secondary schools, socio-cultural factors that affect them and their personal factors that affect performance in mathematics, and established the strategies that can be adopted to improve performance in mathematics. Descriptive survey research design was adopted for the study. The target population was 1876 respondents which comprised of form three secondary school students in Koibatek District, 132 mathematics teachers and 9 head teachers. Three questionnaires were used for data collection. Teachers, students and head teachers' questionnaires. Factors contributing to poor performance include under staffing, inadequate teaching/ learning materials, lack of motivation and poor attitudes by students in learning mathematics. The study is relevant to this study in the sense that the study investigated factors contributing to poor performance in Mathematics in secondary school.

Mubeen, Saeed and Hussain (2013), carried out a study on attitude towards mathematics and academic performance in Mathematics among secondary level boys and girls. The main purpose of the study was to measure relationship of attitude towards mathematics with academic achievement in Mathematics among 9th and 10th class secondary level students. Sample of the study consisted of 500 students out of which 200 were boys and 300 were girls. This sample was chosen from two girls' and two boys schools in wah cantt (Pakistan). The secondary school students were mostly of 15 and 16 years age group. A 25-item questionnaire was self developed in the light of available literature on the subject and adaptation of another instrument, developed by Steinback and Gwizdala. Academic achievement was measured by the marks obtained by the sample in their recently held examination in mathematics in their school. The data obtained were analyzed and interpreted using statistical tool of Pearson product moment correlation co-efficient. The result show that boys differed in their Mathematical achievement from girls. Girls achieved better results as compared to boys. Attitude towards Mathematics and achievement in Mathematics did not go together. The study is related to the topic under investigation, because it examines student's academic achievement in Mathematics based on gender.

Harry (2016), submitted a study on comparative analysis of academic performance of public and private junior high schools in the basic education certificate in Sekondi/Takoradi in Ghana. In this study, the researcher examined the policies made in Ghana which always had quality as their hallmark. Even though quality has been the main aims of many reforms and policies, the desired quality has not yet been achieved. An attempt was made to establish the many reasons why private basic schools were doing considerably better than public schools. The descriptive research design was used in this study. Questionnaire was the main tool used for the research. A sample of 70 respondents were chosen for the research, which consisted of all 10 head teachers of the 10 schools, 3 teachers from each school brought the total teachers to 30. 3 students were chosen by the researcher from each school. In all 30 students were chosen for the study. Data was analyzed using frequencies, percentages, independent sample t-test and one-way ANOVA. Results of the study revealed that private schools were better resourced, had parents of student whose socioeconomic status was higher and were more involved in their children's education. Public schools had more professionally qualified teachers than the private schools. The researcher recommended that, teachers should improvise the teaching and learning resources which were not available in the schools to enhance the quality of education in both private and public basic schools in the country. This study is in line with this research in the area of school type. The present study is also investigating students' academic performance by considering public and private schools and data will be analyzed using ANOVA.Charles

Ogan and Alamina (2014), conducted a research on differential students' study habit and performance in mathematics public secondary schools in Port Harcourt, Rivers State, Nigeria. In order to access students' students study habit and performance in mathematics, the study adopted a descriptive survey using the Students' Study Habit Assessment Scale (SSHAS) instrument. A sample of 400 SSII Students randomly selected from a population of about 2,108 students in 16 public secondary schools were used. The instruments reliability coefficient was 0.86, calculated using the Pearson Product Moment Correlation (PPMC) formula. Research questions were discussed using mean. Hypothesis was tested at 0.05 significant levels using t-test and ranked order correlation coefficient (Spearman rho). Findings of the study revealed that students' do have preference to specific study habits while studying mathematics. Students' with high level of concentration, when devoted more time

to problem solving had high performance irrespective of gender. There are no significant differences between students' study habits and their performance in Mathematics. It is recommended that Mathematics teachers should adopt a wide range of instructional strategies in the teaching of Mathematics at the senior secondary school level. Appropriate workshops and in-service training for Mathematics teacher should be organized periodically, by the state government. This study is related to the work, because it examined the students' performance in mathematics. The difference is in the in the sense of the tools used for data analysis and location of the study.

Oluwatayo (2011), carried out a study on Self-concept and performance of secondary school students in Mathematics. The study investigated the relationship between self-concept and performance in Mathematics as well as the influence of gender on self-concept and performance in Mathematics. 320 SS1 students (male=160, female=160) were used for the study. They were selected from 16 secondary schools (urban=8, rural=8) in eight local government areas of Ekiti State. Random sampling was used to select the local government areas, while stratified random sampling technique was used to select the schools and the participants. Data were collected using a 20-item self-concept questionnaire and a 30-item multiple-choice Mathematics Achievement Test with reliability coefficients of 0.74 and 0.83 respectively, and analyzed using Pearson product moment correlation and t-test statistics, tested at 0.05 level of significance. The results showed that self-concept moderately correlated with performance in Mathematics, while gender had no significant influence on self-concept and performance in Mathematics. However, the mean scores of male and female students in Mathematics were below average. It was suggested that teachers should develop in their students' positive self-concept towards Mathematics and pleasant teaching experiences to enhance higher self-concept and better performance in Mathematics. The study is relevant to this work in the area of students' performance in Mathematics and gender.

Eme (2014), examined a study on school variables and Mathematics performance among students in Akwa Ibom State. This study examined the extent to which school variables (school location, school type and school proprietorship) relatively and collectively

contribute to students' performance in Mathematics. The hypothesis formulated to guide the

Study was proposed and the independent and interactive effects of the selected school variables on JSS 3 students' performance in Mathematics were not statistically significant. The researcher adopted ex- post factor design and also employ stratified random sampling technique .The researcher uses a sample of 853 students from 20 secondary schools in Akwa Ibom State. The study made use of a researcher developed and standardized instrument: a 40 item Mathematics Achievement Test (MAT). The effect by school variables on students' performance in Mathematics was analyzed using a 2-way factorial ANOVA. The result showed that school proprietorship was the only school variable that exerted a significant effect on students' performance in Mathematics. School type and school location did not have any effect on Mathematics performance even after being subjected to an interactive analysis. The researcher recommended, among other things, that teaching and learning situations and conditions should be improved in public and rural schools to enable students in these schools compete favorably with their counterparts in private and urban schools. This study is in line with the present study in area of variables used (school location and school type) as well as method of data analysis that will be used.

2.9.2 Summary of Literature Review and Uniqueness of this Study.

The study adapted the Skinnerian environmental theory and social learning theory by Albert Bandura based on manifestation of learning as a change in behavior, and environment shapes behavior. Skinner argues that learners will adopt good behavior and eliminate bad behavior in order to gain the reward and avoid punishment, because according to him behavior is determine by its consequences. According to Albert Bandura's theory, people learn from one another via observation, imitation and modeling. Therefore, students learn by imitating the stars in the class as well as observing model.

A review of empirical studies was carried out to guide the researcher into previous studies in the area and also to provide the researcher with the theoretical base. Several literature reviewed have indicated few work done in this area. Relevant studies done by other researchers in this area address the matter that related to school factor and school type but did not consider certain mathematics curriculum content areas only Jebson & Wamdeo (2014),

conducted a study on differential students' academic performance in the junior secondary schools in three Mathematics curriculum content areas based on gender and school factors in Maiduguri Borno State, while the present study will be carry out in senior secondary schools in Adamawa State considering four Mathematics curriculum content areas. Alordiah, Akpadaka & Oviogbodu, (2015), investigated a study on influence of gender, school location and socio-economic status on students' academic achievement in Mathematics. The study investigated the influence of gender, school location, and socio-economic status (SES) on students' academic achievement in Mathematics. The academic performance of the students was in favour of the male students as well as the students in the urban, which shows that the female students can imitate the male students.

Harry, (2016). Submitted a study on Comparative analysis of academic performance of public and private junior high schools in the basic education certificate in educational Sekondi/Takoradi in Ghana. This study is unique, because it will be conducted in senior secondary schools and it will cover four Mathematics curriculum content areas based on gender, school type and school location in Adamawa state which non has been done in Adamawa state based on the reviewed literature.

CHAPTER THREE

METHODOLOGY

This chapter discussed the method that was used for the study under the following sub-headings: Research design, area of the study, population of the study, sample and sampling techniques, instrument for data collection, validation of the instrument, reliability of the instrument, method of data collection, and method of data analysis.

3.1 Research Design

The research design that was used for the study was expo facto research design of 2 x 2 x 2 (two - by- two - by - two) factorial matrix. Expo facto research design is a method in which groups with qualities that already exist are compared on some dependent variable. While Factorial matrix is often used by scientists wishing to understand the effect of two or more independent variables upon a single dependent variable, (Martyn, 2009). The research design compared performance of students based on gender, school location and school type. The factorial matrix allowed the researcher to look at how multiple factors affected a dependent variable, both independently and together. The study has three factors that each has two levels. The researcher intended to see the academic performance of male and female SS II students in Mathematics in a public, co-educational system of day and boarding schools.

3.2 Area of the Study

The study was carried out in Adamawa state of Nigeria. Adamawa state is located in the north-eastern part of Nigeria. The State lies between latitudes $9^0\,20'$ North and longitudes $12^0\ 30'$ East with its capital in Yola. Adamawa state was created in 1991 from formal Gongola state (Wikipedia, en.wikipedia.org). Adamawa state is bordered by Borno State to the northwest, Gombe State to the west, Taraba State to the southwest and the Cameroun republic to the east. Tropically, it is a mountainous land crossed by the large river valleys of Benue, Gongola and Yadzaram. Adamawa state is one of the largest states in terms of land mass, occupying about 36.917km. The State has 21 Local Government Areas with five education zones namely: Ganye, Gombi, Mubi, Numan and Yola. All the five education

zones are under the umbrella of Post Primary School Management Board. The Board is under the management of State Ministry of Education. (Adamawa State Post Primary School Management Board Yola, 2018).

Out of the five education zones, Gombi and Yola zone was used for the study. The researcher was interested in urban and rural settlement within the state. Since Yola is the State Capital of Adamawa, the researcher intended to choose the zone. Gombi zone comprises of; Gombi, Girei, Hong and Song Local Government Areas while Yola zone comprises of Yola North, Yola South and Fufore Local Government Areas.

3.3 Population of the Study

The population of the study were all the Senior Secondary School II students in Adamawa state totaling 27,432. There were 304 Senior Secondary Schools in Adamawa state all together with 335 Mathematics teachers. Gombi education zone was having a total of 107 mathematics teachers while Yola Education Zone had a total of 77 Mathematics teachers with 161 Senior Secondary Schools (Adamawa State Post Primary Schools Management Board, 2018).

3.4 Sample and Sampling Technique

A sample of 709 SS II Mathematics students was used for the study. Schools were selected, using purposive random sampling techniques. The researcher used this technique due to the nature of the variables. In Adamawa state there are few mixed boarding schools both in rural and urban. Because of this reason, a stratified random sampling of 12 mixed schools (six from rural and six from urban areas), two boarding mixed schools from each zone and four day mixed schools also from each zone (two from rural and two urban) formed the sample of this study .The 709 students was arrived at by picking 59 students from each of the 12 schools, using Taro Yamane formula. The formula is;

$$n = N/1+N(e)^2$$

A Mathematics teacher of SS II was selected in each school, as research assistant to invigilate the students during the test that was conducted.

3.5 Instrument for Data Collection

The instrument for data collection was Mathematics Performance Test (MPT) The researcher adapted items from the past questions of West African Examination Council (WAEC) and National Examination Council (NECO) 2013-2017. Eight questions from each year and two question from each content. The questions was based on the topics of Senior Secondary School Mathematics curriculum on the following Contents; Algebra, Geometry, Trigonometry and Statistics.

2013- Eight questions (two questions from algebra, geometry, trigonometry and statistics)

2014- Eight questions (two questions from algebra, geometry, trigonometry and statistics)

2015- Eight questions (two questions from algebra, geometry, trigonometry and statistics)

2016- Eight questions (two questions from algebra, geometry, trigonometry and statistics)

2017- Eight questions (two questions from algebra, geometry, trigonometry and statistics)

The instrument consist of forty multiple choice objective test items (A-D) options.

3.6 Validation of the Instrument

The instrument was adapted from 2013-2017 past WAEC and NECO question paper. To enhance the face validity of the instrument, it passed through criticism and observations of three experts, one from the Physical Science Education Department, school of Technology and Science Education, and two from the Department of Mathematics, school of Applied Sciences all from Modibbo Adama University of Technology Yola. The reason for the validation was to ensure that the content of the instrument covers the area under investigation. The table of specifications indicating each number of questions taken from the four content areas of the syllabus covered was specified for validation. Ten questions from each content areas were selected. The experts checked the appropriateness of the instrument and made necessary corrections and amendments. Four questions were changed by the validators. The comments, suggestions, as well as recommendations of the validators were used to make final draft of mathematics performance test (MPT) which contained forty questions.

3.7 Reliability of the Instrument

The researcher established the reliability of the instrument by administering the mathematics performance test (MPT) to 40 non-participating students from Government Secondary School Mubi, in Mubi education zone of Adamawa State. The school was chosen because it operates on the same standard and located in Adamawa State also, but outside the area of the study. The Kuder Richason formula was used to determined reliability of the four content areas that were used which gave the following indices of 0.68, 0.72, 0.62 and 0.74 for algebra, geometry, trigonometry and statistics respectively.

3.8 Method of Data Collection

The data was collected by administering the Mathematics Performance Test (MPT). An introductory letter from the H. O. D. Physical Science Education seeking permission to conduct the study was served to the schools that were used for the study. The researcher employed a research assistant from each school to conduct mathematics performance test for the students. The administration of the instrument took a period of one week in each zone. Each of the students was assigned with a serial number which served as an examination number on the question papers during the study and space were provided to indicate the sex. The researcher served as general supervisor throughout the study.

3.9 Method of Data Analysis

Data collected during the study were analyzed using Statistical Package for Social Sciences (SPSS). Research questions were tested using mean and standard deviation, while hypotheses 1-3 were tested using Z-test and hypothesis 4 were tested using one-way Analysis of Variance (ANOVA) and was tested at 0.05 level of significance. The decision rule for testing the stated hypotheses is as follows; reject the null hypothesis if $p<0.05$, otherwise do not reject. 10 marks were allocated for each content as follows;

1. Algebra - 10 marks
2. Statistics - 10 marks
3. Geometry - 10 marks
4. Trigonometry - 10 mark

During the analysis the total score by each student was converted to 100%

CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter presents and discusses the results of the data analysis in line with the research questions

4.1 Results

Seven hundred and nine questionnaires were retrieved for analysis. The results of the analysis of the three research questions were answered using mean and standard deviation and presented using tables 1 to 4. Hypotheses one, two and three were tested using Z-test. While Analysis of Variance (ANOVA) were used to test hypothesis four at 0.05 level of significance as presented in table 7.

4.1.1. Research Question 1. What are the mean scores of Senior Secondary II students' academic performance in Mathematics based on gender?

Table 1: Mean and Standard Deviation of Male and Female Students Performance of SS II Students in Mathematics.

Gender	n	Mean	SD	SE	Mean Diff.
Male	354	16.14	7.15	0.38	1.12
Female	355	15.02	7.14	0.38	

The male students outperformed female students on academic performance in Mathematics with mean difference of 1.12 as indicated in table 1.

4.1.2 Research Question 2. What are the mean scores of Senior Secondary II students' academic performance in Mathematics based on school location?

Table 2: Mean and Standard Deviation of Urban and Rural Students Performance of SS II in Mathematics.

School Location	n	Mean	SD	SE	Mean Diff.
Urban	355	16.47	8.26	0.44	1.88
Rural	354	14.59	5.77	0.31	

Table 2. Shows that, urban students were 355 in number with mean score of 16.47 and standard deviation of 8.26 which is greater than the rural group having a mean score of 14.59 with standard deviation of 5.77 while the group were 354 in number. This indicates that urban students outperformed rural students in academic performance in Mathematics with mean difference of 1.88 as indicated in table 2.

4.1.3 Research Question 3. What are the mean score of Senior Secondary II students' academic performance in Mathematics based on school type?

Table 3. Mean and Standard Deviation of Boarding and Day Students Performance of SS II in Mathematics.

School Type	n	Mean	SD	SE	Mean Diff.
Boarding	239	15.60	9.03	0.58	0.00
Day	470	15.60	6.01	0.28	

Table 3. Shows that, boarding students were 239 in number with mean score of 15.60 and standard deviation of 9.03 which is equal with the day students group having a mean score of 15.60 with standard deviation of 6.01 while the group were 470 in number. This indicates that, the two groups are equal in performance in Mathematics.

4.2 Testing Hypotheses.

The data collected in respect to hypothesis in this study were subjected to Z-test and Analysis of Variance (ANOVA). The result of Z-test and Analysis of Variance (ANOVA). Were presented in table 4-7.

4.2.1. **$H0_1$**: There is no significant mean difference in academic performance of Senior Secondary II students Mathematics based on gender.

Table 4. Z-test for the mean difference between male and female Students of SS II in Mathematics.

Gender	n	Mean	SD	SE	Z	p-value	Mean Diff.	Remark
Male	354	16.14	7.15					
				0.38	2.09	0.04	1.12	Rejected
Female	355	15.02	7.14					

SD- Standard Deviation, SE- Standard Error

Table 4 revealed that, there is significant difference between male and female students [Z = 2.09 (df 707), P(0.04)<0.995]. Since the computed p-value (0.04) is less than 0.05 level of significant, the null hypothesis of no significant difference is rejected. Hence, there is significant mean difference between male and female students' academic performance in Mathematics in favour of male students as indicated in Table 4.

4.2.2. **$H0_2$**: There is no significant mean difference in academic performance of Senior Secondary II students in Mathematics based on School location.

Table 5. Z-test for the mean difference between urban and rural Students of SS II in Mathematics.

School Location	n	Mean	SD	SE	Z	p-value	Mean Diff.	Remark
Urban	355	16.47	8.26	00.44	3.53	0.00	1.88	Rejected
Rural	354	14.59	5.77					

SD- Standard Deviation, SE- Standard Error

The results of the analysis in Table 5 revealed that, there is significant difference between rural and urban students [Z = 3.53, (df 707), p(0.00)<0.05]. Since the computed p-value (0.00) is less than 0.05 level of significant, the null hypothesis of no significant difference is rejected, meaning there is significant difference between rural and urban students' academic performance in Mathematics in favour of urban students as indicated in table 5.

4.2.3 $H0_3$: There is no significant mean difference in academic performance of Senior Secondary II students in Mathematics based on School type.

Table 6. Z-test for the mean difference between boarding and day students of SS II in Mathematics.

School Type	n	Mean	SD	SE	Z	p-value	Remark
Boarding	239	15.60	9.03	0.58	0.07	0.99	Not Rejected
Day	470	15.60	6.01	0.28			

SD- Standard Deviation, SE- Standard Error.

The results of the analysis in Table 6 revealed that, there was no significant difference between boarding and day students with [Z = 0.07, (df 707), P(0.99)>0.05. Since the computed p-value (0.99) is greater than 0.05 level of significant, the null hypothesis of no

significant difference was not rejected, meaning there was no significant difference between boarding and day students' academic performance in Mathematics as indicated in table 6.

4.2.3. $H0_4$: There is no influence of gender, school location and school type on students' academic performance of Senior Secondary II students in Mathematics.

Table 7. One-way ANOVA Analysis

Summary of ANOVA for Academic Performance

Source of Variation	Sum of Squares	DF	Mean Square	F	p-value	Remark
Between Groups	1.57	2	0.78	0.02	0.99	Not Rejected
Within Groups	109.23	2124	51.40			
Total	109.80	2126				

The results of the One-way ANOVA analysis in Table 7 revealed that, there is no significant differences among gender, school location and school type on students, academic performance in Mathematics [F = 0.02 ,(df = 2, 2126), P(0.99) > 0.05]. Since the computed p-value (0.99) is greater than 0.05 level of significant, the null hypothesis of no significant difference was upheld, meaning there was no significant differences among gender, school location and school type on students' academic performance in Mathematics.

4.3 Findings of the Study

1. Male students performed better than the female students in algebra, trigonometric, geometry and statistics.
2. The urban students performed better than the rural students in algebra, trigonometric, geometry and statistics.
3. The boarding students and the day students performed the same in algebra, trigonometry, geometry and statistics.
4. The academic performance of students based on gender, school location and school type in algebra, trigonometry, geometry and statistics has no significant difference.

4.4 Discussion of Findings

The main focus of this study was to investigate the influence of gender, school location and school type on students' academic performance in Mathematics in public Senior Secondary II students in Adamawa state.

The results on table 1 showed the mean scores of Senior Secondary II students' academic performance in Mathematics based on gender. From the results, the two group has slightly equal scores. But males outperformed the females in academic performance in Mathematics with mean difference of 1.12 as indicated. This agreed with the findings of Adeneye (2011) that there were significant differences in Mathematics performance of male and female students in favour of male students. Also, Alordiah and Oviogbodu, (2015), investigated the influence of gender, school location and socio-economic status on students' academic achievement in Mathematics. The results show that male students performed better than females students, also urban students performed better than the rural students.

The result from hypothesis one indicated that there is significant mean difference in academic performance of Senior Secondary II students in Mathematics based on gender. This also contradict the findings of Jebson and Wamdeo, (2014), who found out that there were no significant gender differences in academic performance in number and numeration, algebra, geometry and measuration. Likewise the study of Oludipe (2012) and Kola and Taiwo (2013) observed that there were no significant difference between male and female students' performance, but Saidin and Brahim (2011), found out that the boys performed better than girls in Mathematics and sciences improved in a single gender settings. Also Forgaz and Rivera (2012), Atnafu (2011) and Ahmed and Bora (2011), reported that gender differences in Mathematics still existed and that the male students were more positive towards Mathematics learning. However, Vale (2012), reported that the gender group in Mathematics achievement is closing up.

The results in hypothesis two showed that the urban students outperformed the rural students, which indicated that there is significant differences in students' academic performance of Senior Secondary II students' in Mathematics. The finding concurred with the earlier findings of Onoyase (2015), which carried out a study on academic performance among students in urban, semi-urban and rural Secondary Schools. The study showed that,

there was a significant difference in the academic performance among students in urban, semi-urban and rural secondary schools in English Language and Mathematics in favour of the urban students. Also Musibau and Johnson (2010), examined the influence of school sex, location and school type on students' academic performance in Secondary Schools. Musibau revealed that School type, sex, and location has no significant influence on students' academic performance.

The result of hypothesis three of the study showed that there is no significant differences between Senior Secondary II students in boarding School and day Schools. This result concurred with the findings of Mulkah (2017), which indicated that boarding and day school students, performed equally and significant differences does not exist between their performances, but the finding of Elisha and Daniel (2015), indicated that students who study Mathematics through boarding schools outperformed their colleagues who studied Mathematics as non-boarding Schools. Elisha concluded that the significance difference in performance were due to the better study atmosphere at boarding Schools.

The result from the fourth hypothesis showed the combination of the three variables at two different levels indicating that there is no influence in students' academic performance of Senior Secondary II students in Mathematics, based on gender, school type and school location which concurred with Jebson and Wamdeo (2014), who carried out a study on differential students' academic performance in the Junior Secondary School three Mathematics curriculum content areas based on gender and School factors. The results obtained indicated that there were no significant gender differences in academic performance in number and numeration, algebra, geometry and measuration. But analysis on everyday statistics indicated that, there was significant gender difference in students' academic performance in favour of male students.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS.

5.1 Summary of the Study

The study investigated the influence of gender, School location and School type on students' academic performance in Mathematics in Senior Secondary Schools in Adamawa State. The objectives of the study was to determine whether there is influence in academic performance of Senior Secondary II students in Mathematics based on gender, School location and School type. The selected content are; algebra, trigonometric, geometry and statistics. Three research questions and four hypotheses were raised for the study and were tested at 0.05 level of significance.

The study adapted the Skinnerian environmental theory and social learning theory by Albert Bandura based on manifestation of learning as a change in behavior, and environment shapes behavior. The literature reviewed the influence of gender, school location, school type on students' academic performance in Mathematics. Other related studies was reviewed covering students' academic performance among students in urban, semi-urban and rural as well as gender.

The research design that was used for the study was expo facto research design of 2 x 2 x 2 (two - by - two - by - two) factorial matrix. The study adopted purposive random sampling techniques to sample two education zones out of the five education zones in Adamawa state. Twelve schools were sampled from the two zones. The targeted population of the study were all the SS II students in public Schools in Adamawa State. Forty non-participating students were used for trial testing Mathematics Performance Test (MPT) instrument adapted from past question papers of WAEC and NECO, from 2013 – 2017. The instrument consisted of forty multiple choice questions, with four options (A-D). Seven hundred and nine students constituted the sample. The data collected were analyzed using standard deviation for research questions while Z-test was used for hypotheses one, two and three and analysis of variance (ANOVA) for hypothesis four.

The result of data analyzed revealed that the urban students perform better than the rural students and that male students perform better than the female students in Mathematics.

5.2 Conclusion

Based on the findings of this study, it was concluded that the male students performed better than the female students in algebra, trigonometric, geometry and statistics. While the urban students performed better than the rural students in algebra, trigonometric, geometry and statistics. But the boarding and the day students performed the same in algebra, trigonometric, geometry and statistics. On the basis of the findings in this study, a conclusion has been drawn. It has been proven that there is no difference in Mathematics performance of students based on gender, school location and school type.

5.3 Recommendation

Based on the findings of the study the following recommendations have been made:

1. School should put up programmes and policies such as Mathematics quiz, extra moral lessons and proper revision of Mathematics questions so as to encourage students to perform better.
2. Government should provide equal distribution of Mathematics teachers as well learning facilities in both urban and rural areas for students to perform better in Mathematics.
3. Constant practice in Mathematics on the side of students and meaningful revision organized by teachers should be enhanced.
4. Efforts should be made to ensure gender does not hinder learning Mathematics amongst students. Teachers, parents and siblings of the students should encourage both the female and male learners to equally embrace Mathematics.

5.4 Suggestions for the Study

The findings of this study has generated areas for further research in the following areas:

1 There is need to replicate this study across the country, since it was limited to Adamawa State.
2. Gender, Equity and Social Inclusion in Academic Performance of Senior Secondary Schools Mathematics and Sciences can also be carried out.
3. Influence of gender, School location and School type on students' academic performance in Junior Secondary School in Adamawa State.

REFERENCES

Abdullah, S., & Bichi A. A., (2015). Gender issue in student academic performance in English Language. *Kano Journal of Educational Studies*, 4(1), 131-138.

Abimbola, I. O., (2013). The misunderstanding world in science: towards a technology of perfect understanding for all. (123rd), inaugurate lectures University of Ilorin: Unilorin Press.

Adamawa State Post Primary Schools Management Board Yola, (2018). Directorate of research planning and statistics.

Adebola, P. A., (2007). Effect of students' exposure to test items generation on their achievement in mathematics. *Continental Journal of Education Research,* 6(1), 27-32.

Adeneye, O. A., (2011). Is gender a factor in mathematics performance among Nigerian, senior secondary students with varying school organization and location? *International Journal of Mathematics Trends and Technology* http://www.internationaljournalssrg.org, 2(3), 17-21.

Adetunde, A.I. & Asare, B., (2009). Academic arena, http://www.sciencepub.org.aarenaj@gmail.com. Retrieved 27 March, 2018; 1 (4), ISSN 1553-992X.

Adeyinka, A. A. & Kaino, L. M. (2012). Quantile analysis of the mathematics achievement – attitude relationship by gender. *European Journal of Social Sciences. http://www.europeanjournalofsocialsciences.com,* 34(3), 452-460.

Adeyinka, A. A. & Kaino, L. M. (2014). School type, parental influence and mathematics attitudes-achievement relationship: A quintile analysis. *Journal of Educational and Social Research*, 4(6), 221-228.

Ahiaba, J. & Igweonwu, R.N. (2003). A comparative study of the performance of boys and girls in SSCE science subjects in Dekina, Kogi State.(Unpublished Bachelor of Science Education (B.Sc. Ed) project). Department of Science Education Faculty of Education, University of Nigeria, Nsukka.

Alokan, F.B. (2010). Influence of Sex and Location on Relationship between student

Alimi, O. A S., Ehinola, G. B. & Alabi, F. O. (2012). School Types, facilities and academic performance of students in senior secondary schools in Ondo State, Nigeria www.ccsenet.org/ies. *International Education Studies,* 5(3), 1-5

Alokan, F. B & Arijesuyo, A. E (2013). Rural and urban differential in student's academic performance among secondary school students in Ondo State. *Journal of Educational and Social Research, MCSER Publishing, Rome-Italy*, 3(3), 213-217.

Alordiah, C. O., Akpadaka G. & Oviogbodu C. O. (2015). The influence of gender, school location and socio-economic status on students' academic achievement in mathematics. *Journal of Education and Practice, www.iiste.org*, ISSN 2222-288X, 6(17), 425-433.

Amelink, C. T. (2012). Female interest in mathematics. Apply Research to practice (ARP) Resources. Retrieved < March 12, 2018> from http://www.engr .psu.edu/AWE/ARPResources.aspx.

Atebe, H. U., (2008). Students' high levels of geometric thought and conception in plane geometry. A collective case study of Nigeria and South Africa. Unpublished Doctoral thesis, Rhodes University, South Africa.

Ato K. A. & Adelaide K. O., (2015). Gender differences and mathematics achievement of senior high school students in Ghana. *Journal of Education and Practice.* www.iiste.org, 6(33), 67-74. ISSN 2222-288X.

Atovigba, M. V., (2014). Mathematics achievement based on gender among eight grade school students. *Journal of Mathematics and Mathematics Education,* 4 (2), 42-44.

Awofala. A. O. A. (2007). Women and learning of mathematics. *African Journal of Historical Science,* 3 (1), 195 – 213.

Basuki, Sukur. (2013). Full Day School Should Be Proportional Based Form and Level of school. Diakses tanggal 5th August, 2016. http://smkn1lmj.sch.id/dl/fuldayschool.pdf.

Boynton, M., Carrico, C., Paretti, M. C., and Matusovich, H. (2013). Understanding barriers to engineering as a career choice for Appalachian youth: investigating the "heat" of the region. http://se.asee.org/proceedings/A/SEE2013/ papers 2013/127. PDF. Retrieved 10/03/2018. *British Journal of Education, Published by European Centre for Research Training and Development UK, (www.eajournals.org),* 4(8), 72-83.

Charles-Ogan, G. & Alamina, J. (2014) Differential students' study habit and performance in mathematics. *Journal of Education and Practice* www.iiste.org, 5(35), 133-139.

Charles-Ogan, G. and George, N. R. (2015). Investigating difficult concepts in senior secondary school mathematics curriculum as perceived by students. *International Journal of Academic Research and Reflection;* 3(6), 67-74.

.

Chebet, C. M., (2016). Gender differences in mathematics performance among secondary school students in Bureti sub-county, Kericho county Kenya. (Unpublished thesis submitted to the school of Education, Kenyatta University).

Chukwu, L. O., (2014). Relationship among test anxiety, academic achievement and interest of senior secondary school students in geometry in Enugu State. (Unpublished master's thesis, University of Nigeria Nsukka Nigeria).

Colom, R., & Lynn, R., (2004). Testing the developmental theory of sex differences in intetellengence in 12-18 years old, *Personality and Individual Differences*, 36 (6), 1003-1029

Curto, Vilsa E., and Roland G. Fryer, Jr.(2014). "The potential of urban boarding schools for the poor: Evidence from SEED." *Journal of Labor Economics*, 32（1）: 65–93.

Daso, P.O. (2013). Teacher variables and senior secondary students' achievement in mathematics in Rivers State, Nigeria. *European Scientific Journal*, 9(10), 271-289.

Davis K.P. (2007). Educating a stem workforce: New strategies for U-M and the state of Michigan, paper presented at educating a stem work force summit, May, 21 2007). http://www.umich.edu/htdocs/releases/plainstory.php?id=5895.

Dervitsiotis, H., (2004). Production/operations management. Durban: Irwin publishing.

Development Division, West African Examination Council (WAEC), (1991-2016) Yaba, Lagos, Nigeria.

Duruji, M. M., Azuh D. and Oviasogie F. (2014). Learning environment and academic performance of secondary school students in external examinations in Nigeria. Paper Presented at the Proceeding of EDULEARN 14 conference 7th-9th July 2014, Barcelona, Spain, 5012-5053.

Elekwa, U.C.C., (2010). Effects of collaborative teaching/ learning strategies on mathematics achievement of senior secondary school students of Abia State of Nigeria. Unpublished PhD thesis, faculty of Education University of Port-Harcourt Nigeria.

Elisha K. N. and Daniel N. (2015). Disparities in performance in mathematics between boarding and non-boarding schools in Manic land Province, Zimbabwe. *Journal of Business and Management (IOSR-JBM)*, 17 (5), 01-05.

Else-Quest, N., J. Hyde & M. Linn (2010), "Cross- national patterns of gender differences in mathematics: A meta-analysis," psychological bulletin. *Journal of Educational Research*, 136(1), 103-127.

Eme, U. J. (2014). School variables and mathematics performance among students in Akwa Ibom State. *International Journal of Development and Sustainability, ISSN: 2168-8662. www.isdsnet.com/ijds*, 3(7), 1558-1568.

Etukudo, U. E., (2014). The effect of computer assisted instruction on gender and performance of junior secondary school students. Retrieved from www.ios.journals.org/iosr-jrme/paper. March, 2018.

Eze, F.N., (2010). Influence of school environment on academic achievement of students of public secondary school in Enugu State. Unpublished PhD thesis, Department of Educational Foundation University of Nigeria, Nsukka.

Federal Republic of Nigeria (2014). National Policy on Education. Lagos NERDC Press

Fynn, J. R., (1998). Israeli Military IQ Test: Gender differences small: IQ gains Large, *Journal of Biosocial Sciences*, 30, 541-553.

Ganley & Lubienski, (2016). Current research on gender differences in mathematics.

https://www.nctm.org/Publications/Teaching-Children-Mathematics/Blog/Currrent-Reasea posted May 9, 2016.

Ngeno, V. C., Enose M.W. & Ayodo T.M., (2012) Cost effectiveness analysis of educating girls in day and boarding secondary schools in Kenya: a case study of Kericho District. *URL: www.intersjournals.org/ER*

Goodpaster, K.P.S., Adedokun, O. A., and Weaver G. C. (2012), Teachers' perceptions of rural STEM Teaching: Implication for rural teacher retention. *Rural Education*, 23 (5), 9-22.

Guarisco, C. (2010). Single sex schools and gender roles: Barrier or breakthrough? Retrieved from www.Iue.edu/lae/academics/special centre/.../chrissy-Guarico.pdf, April, 2017.

Guiso, L., Ferdinando, M. Sapienza, P., & Zingales L., (2008, May). Culture, gender and mathematics. *Journal of Science*, 3 (5), 1164 – 1165.

Harry, D.B. (2016). A comparative analysis of academic performance of public and private junior high schools in the basic education certificate in Sekondi/Takoradi. *European Journal of Basic and Applied Sciences*, 3(1), 2059-3058.

Heilbron, J. L., (2015). *Geometry.* Encyclopedia Britannica. Retrieved May 16, 2017 from www.britannica.com/topic/geometry.

Hopkins, T. M. (2014). Gender issues in mathematics achievement in Tennesse: Does rural locate matters? (A Ph. D dissertation, university Tennesse). http://www.ns.umich.edu/htdocs/releases/print.php?htdocs/releases/plainstory.php?id=5895&html.

Hyde, J S., Lindberg, S. M., Linn, M. C, Ellis, A.B. & Williams, C.C. (2008). Gender characterize mathematics performance. *Journal of Science*, 321, 494-495.

Hydea, J. S. & Mertzb, J. E. (2009). Gender culture and mathematics performance. Retrieved from http://tctviveo.madison.com/uw/gender, February, 2018.

Igbinedion, V. T. & Epumepu, E. A., (2011). A comparison of students' academic performance in business studies in public and private junior secondary school

certificate examination (JSSCE). *Technical and Vocational Education Journal (TVEJ),* 3 (1), 42-53.

Igboegwu, E. N., & Okonkwo, I. G. A. (2012). Influence of gender and location of school on students' achievement in chemistry. *Journal of Research in Education*, 1(1), 1-14.

Iwuoha, R.K. (2007). Factors affecting scholastic achievement: an experimental study of some factors related to scholastic achievement. *Journal of Education*, 13(4), 28-33.

Jebson, R.S., & Wamdeo, Y.Y., (2014). Differential students' academic performance in the Junior Secondary School three mathematics curriculum content areas based on gender and school factors. *Jewel Journal of Scientific Research,* 2(1 & 2), 132-141.

Joseph, A. M., (2015). Effects of school location on learner's academic performance in secondary schools in Makambako town council, Njombe. (Unpublished dissertation submitted in partial fulfilment of the requirements for the degree of masters of education in administration, planning and policy studies of the Open University of Tanzania.) *Journal of Education and Practice, www.iiste.org*, 6(17), ISSN 2222-288X.

Joseph E. N. & Emmanuel A. E. (2017).Influence of school location on students' attitude towards mathematics and basic science. *British Journal of Education.* Published by European Centre for Research Training and Development UK (www.eajournals.org), 5(10), 76-85.

Kaggwa, V., (2003). Contribution of teachers' involvement in school administration on students' academic performance in private schools, Kampala: Makere'

Kiefer, A.K., & Sekaquaptewa, D., (2007). Implicit stereotypes, gender identification, and mathematics related outcomes: A prospective study of female college students, psychological science, 18, 13 – 18.

Kola, A. J., & Taiwo, A. K., (2013). Analysis of gender performance in physics in colleges of Education, Nigeria. *Journal of Education and Practices*, 4(6), 1-5.

Kosgei K. Z. & Keter K. J., (2016). Conflict and trade-offs between efficiency and access: A case of day and boarding secondary schools in Kenya. *Journal of Education and Practice*, 7(26), 111-119.

Locke, J., [1690] 1917. Two treatises of government. Cambridge University Press, New York, 464. *Journal of Humanities and Social Science (JHSS).* Retrieved 03/04/2018, 6(4), 38-41.

Lwaitama, A. and Galabawa, J., (2008). The status of the schools in the context of the secondary education development programme (SEDP) Tanzania education network (TEN/MET). 28. [http://www.ten/met.com/education/quality] pdf. Retrieved April 2017.

Mackintosh, N. J., (1998). Reply to Lynn. *Journal of Biosocial Sciences,* 35, 145-150McGinnis, E., & Goldstein, A. P. (1997). Skillstreaming the elementary school child: New strategies and perspectives for teaching prosocial skills. Champaign. IL: Research press.

Martyn S., (2009). Factorial Design. Retried June 05, 2019

from Explorable.com:https://explorable.com/factorial –design

Mburu, N. P. D. (2013). Effects of the type of school attended on students' academic performance in Kericho and Kipkelion districts, Kenya. *International Journal of Humanities and Social Science,* 3(4), 79-90.

Monk, D. H., (2007). Recruiting and retaining high-quality teachers in rural areas. The future of children, 17 (1), 155-174.

Mubeen S., Saeed S. & Hussain, (2013). Attitude towards mathematics and academic achievement in mathematics among secondary level boys and girls. *Journal of humanities and social science (JHSS).* Retrieved 03/04/2018, 6(4), 38-41.

Mulkah A. A., Nkechi. E. O & Bolande T. D., (2017). Comparison of boarding and day senior secondary school students' performance in biology. *Asia Pacific Journal of Education, Arts and Science,* 4 (5), 45-50. *www.apjeas.apjmr.com.*

Musibau A. Y. & Johson T. A., (2010). The influence of school sex, location and type on students' academic performance. *Internal Journal of Educational Science,* 2 (2); 81-85.

National Coalition for women and girls in education (2008), Title TX at 35: Beyond the Headlines. Washington DC.

Ngeno, V. C., Eriose M. W. & Ayodo T. M., (2012). Cost of effeteness analysis of educating girls in day secondary school in Kenya. www.intersjournals.org/ER.

Nnamani, S. C., & Oyibe, O. A., (2016). Gender and academic achievement of secondary school students in social studies in Abakaliki urban of Ebonyi State. *International Journal on New Trends in Education and Their Implications/ www.ijonte.org, ISSN 2059-3058.* ISSN 2222-1735 (Paper) ISSN 2222-288X, 5(35), *2281-3993. Academic Journal of Interdisciplinary Studies, ISSN: 2168-8662 – www.isdsnet.com/ijds,* 3(7), 1558-1568.

Odumosu, M.O, Oluwayemi, M.O., & Olatunde, T.O., (2012). Mathematics as a tool in technological acquisition and economic development in transforming Nigeria to

attain vision 20: 20: 20, a proceeding of mathematical association of Nigeria (MAN) annual national conference, 199-207.

Okon, E. C. & Archibong, U.I., (2015). School type and students' academic performance in social studies in junior secondary certificate examination (JSCE). *Academic Journal of Interdisciplinary Studies, MCSER Publishing, Rome-Italy,* 4(2), 2281-3993.

Oludipe, D. I., (2012). Gender difference in Nigerian junior secondary students' academic achievement in basic science. *Journal of Education and social research*, 2(1), 93-98.

Olunloye, O., (2010). Mass failure in mathematics: A national disaster. Retrieved from http/www.tribune.com.ng 03/04/2018.

Oluwatayo, J. A., (2011). Self-concept and performance of secondary school students' in mathematics. *Journal of Educational and Developmental Psychology*. *www.ccsenet.org/jedp*,1(1), 176-183.

Onoyase A., (2015). Academic performance among students in urban, semi-urban and rural secondary schools counseling. Developing country studies www.iiste.org. Online paper, 5(19), 122-126.

Overmyer, G. R., (2010). History and effectiveness of mastery learning in mathematics. Retrieved 3rd April 2018. Pi.ning.com/files/.

Park, H., Behrman, J. R. & Choi, J. (2012). Causal effects of single-sex schools on college entrance exams and college attendance: Random assignment in Seoul High Schools. PSC Working Paper Series, PSC 10-01. http://repository. Upenn.edu / psc_ working papers/15.

Prakash J., (2011). A Short Essay on the Importance of Mathematics. Joom/Art.com. Retrived march, 2018. www.preservearticles.com/2011052469.

Raychaudhuri, A., Debnath, M., Sen, S., and Majumder, B. G., (2010). Factors affecting students' academic performance: A case study in Agartala Municipal Council Area. *Bangladesh e-Journal of Sociology,* 7(2), 34-41.

Sikiru A. A. and Akeem, B. D., (2012). School environmental factor and mathematics teaching effectiveness: Implication for E-learning library philosophy and practice. *(e-journal), 837. http://digital commons.unl.edu/libphilprac/837.*

Singh, Y. K. (2010). *Dictionary of education*. New Delhi: A. P. H Publishing Corporation. Retrieved October 15, 2017, (2309).

Sipple, J. W., & Brent, B. O. (2008). Challenges and opportunities associated with rural school settings. In H. F. Ladd & E. B. Fiske (Eds.), *Handbook of research in education finance and policy*. New York: Routledge, 612– 629.

Steel, F. Vignoles, A. and Jenkins, A. (2007). The effects of school resources on pupil attainment: A multilevel simultaneous education modeling approve. *Journal of the Royal Statistical Society,* 179 (3), 801-824.

Sullivan, K., Perry, L.B, and McConney, A. (2013). How do school resources and academic performance differ across Australia's rural, regional and metropolitan communities? *The Australian Educational Researcher,* 3 (40), 353-372.

Sullivan, A., H. Joshi and D. Leonard (2010), "Single-sex schooling and academic attainment at school and throughout the life course," *American Education Research Journal*, 47(1), 6-36.

Sylvia A. M., Francis C. I., Lucas O. A. (2011). Influence of attitude on performance of students in Mathematics curriculum. *International Research Journal*, 2(3), 965- 891.

Tata, U. S., Abba A., & Abdullahi M. S., (2014). The causes of poor performance in mathematics among public senior secondary school students. Nigeria. *Journal of Rese*arch *& Method in Education (JRME),* 4(1), 45-90.

Test Development Division, West African Examination Council (WAEC) Lagos, Nigeria. http://www.peopledaily-online.com/news/education/2348.

Retrieved, March, 2017

Thompson, T., & Dinnel, D. L., (2007). Poor performance in mathematics: Is there a Basis for a Self Work Explanation for Women? *Journal of Educational Psychology*, 27, 377-389.

Titus, P. G., (2010), Influence of school type on the academic achievement of senior secondary school in Adamawa State, Nigeria. (Unpublished thesis submitted to the department of science education, school of technology and science education, Modibbo Adama University of Technology Yola, Nigeria).

Tuna, A., & Kacar, A., (2013).Effect of learning circle model in teaching trigonometry on students' academic achievement and the permanence of their knowledge. *International Journal on New Trends in Education and their Implications,* 4(7), 1309-6249.

Uwadiae, I. (2010) WAEC releases may/June WASSCE results. This day newspaper of 20/08/2010. Retrieved from allafrica.com.nigeria.nig on 06/05/2017,

Victoria L., (2016), Understanding Educational Inequality in Rural Lincolnshire: A Statistical Interrogation of Gaps in Educational Achievement. International conference 5th edition. 17-18 march 2016.

West African Examination Council (1991-2016) and (2010-2016). Chief Examiners Report. Lagos, Nigeria: (WAEC).

West African Examination Council (2010). Chief Examiner's Reports. May/June SSCE, Lagos: WAEC Publication.

West African Examination Council (WAEC), (2007-2016). Chief Examiners Reports Yaba: Lagos, Nigeria.

Wikipedia, https://www.wikipedia.org. Retrieved February, 2017.

Yang, J. C., & Chen, S.Y., (2010). Effects of gender differences and spatial abilities within a digital pentominoes game. Retrieved from www.elsevier.com/locate/compedu, 55, 1220-1233.

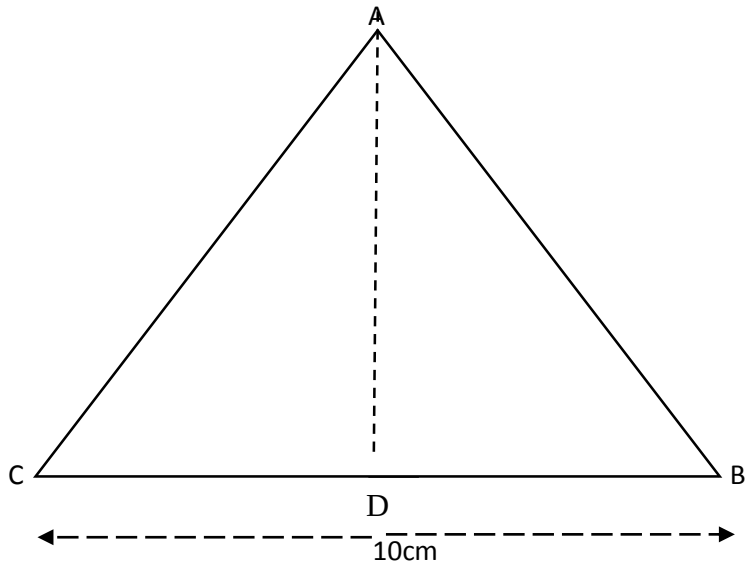
Zachariah, K. M., George, M. M. & George, R. N. (2012). Factors contributing to students' poor performance in mathematics. *American International Journal of Contemporary Research*, 2(6), 87-91.

Zalmon, I. G. And Wonu, N., (2017). Comparative analysis of student mathematics achievement in West African senior secondary certificate examination in Nigeria. *European Journal of Research and Reflection in Educational Sciences.* Progressive academic publishing, uk.www.idpublications.org, 5(1), 24-31.

APPENDIX I: INSTRUMENT

SECTION A: STUDENTS PERSONAL DATA
NAME OF SCHOOL: ……
CLASS: ……
SUBJECT: MATHEMATICS
TIME ALLOCATED: 1HOUR 30 MINUTES
GENDER: MALE [ ] FEMALE [ ]
TYPE OF SCHOOL: MIXED [ ] SINGLE [ ]
SECTION B: MULTIPLE TEST QUESTIONS
INSTRUCTION: Answer all questions by circling the appropriate answer from the options provided. All questions carry equal marks.

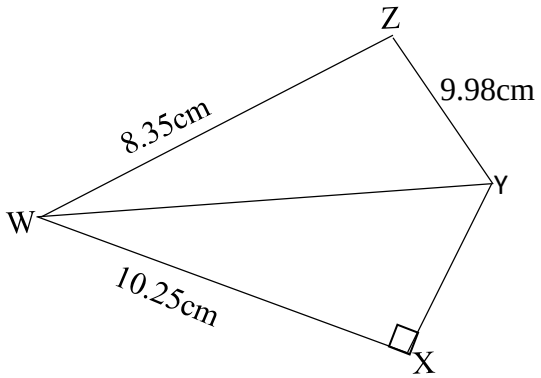
1.



In a triangle ABC, AD the altitude of the triangle is 7cm. if BC= 10cm, find the area of triangle ABC.

A. $18cm^2$ B. $29cm^2$ C. $35cm^2$ D. $40cm^2$

2.



From the fig above find XY, correct to 2 decimal places.

A. 8.01 cm B. 7.00cm C. 4.78cm D. 8.485cm

3. In a triangle ABC in which $\hat{A}= 81^0$, a= 9.3cm, $\hat{C}= 42^0$ find $\hat{B}$?

A. 43^0 B. 90^0 C. 57^0 D. 0^0

4. Which of the following is not necessarily true of a rectangle?

A. the diagonals divide each other. B. the diagonals are equal. C. Each diagonal divides the area of the rectangle equally. D. the diagonals are not congruent.

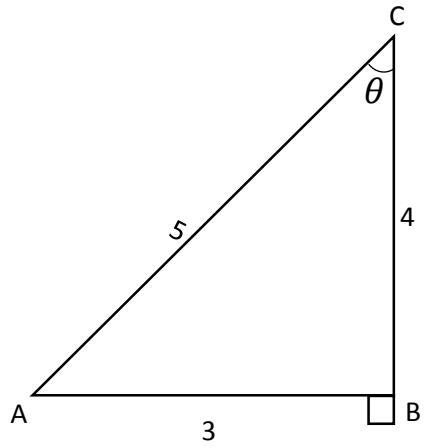
5. Determine in which quadrant angle 120^0 lie

A. First quadrant B. fourth quadrant C. second quadrant D. third quadrant

6. Simplify: 3x - (p-x) - (r-p)

A. 2x-r B. 2*x*+r C. 4*x*-r D. 2*x*-2p-r

Use the diagram below and answer question 7 and 8



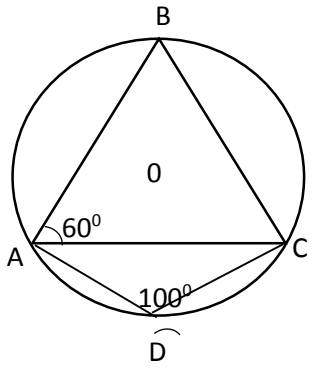
7. Find Sin θ

A. 0.8
B. 0.6
C. 0.9
D. 0.5

8. Find Cos θ

A. 0.3 B. 0.4 C. 0.1 D. 0.8

9.



In the figure above ABC, is a cyclic triangle and 0 is the center of the circle. Find $\angle$ ACB.

A. 20^0 B. 40^0 C. 60^0 D. 80^0

10. The average age of a group of 25 girls is 10 years. If one girl age 12 years and 4 months joins the group, find correct to one decimal place, the new average age of the group.

A. 10.1 years B. 9.3 years C. 8.7 years D. 8.3 years

11. The age of Tunde to Ola is in the ratio 1:2. If the ratio of Ola's age to Musa's age is 4:5. What is the ratio of Tunde's age to Musa's age?

A. 1:4 B. 1:5 C. 2:5 D. 5:2

12. Simplify $\frac{3^{n-1}\ X\ 27^{n+1}}{81^n}$

A. 3^{2n} B. 9 C. 3^n D. 3^{n+1}

13. If $\frac{2}{x-3} - \frac{3}{x-2}$ is equal to $\frac{p}{(x-3)(x-2)}$ find p.

A. -x-5 B. -(x+3) C. 5x-13 D. –x +5

14. The probabilities that Mary, John and Omar will hit a target are $\frac{2}{3}$, $\frac{3}{4}$ and $\frac{4}{5}$ respectively. Find the probability that only Mary will hit the target.

A. $\frac{2}{5}$ B. $\frac{7}{60}$ C. $\frac{1}{30}$ D. $\frac{1}{60}$

15. Which of the following is used to determine the mode of a group data?

A. Bar chart B. Frequency polygon C. Ogive D. Histogram

16. Let U = {1, 2, 3, 4}, P = {2, 3}, Q = {2, 4} what is $(P \cap Q)'$?

A. {1, 2, 3} B. {1, 3, 4} C {2, 3} D. {1, 3}

17. A fair die is rolled once. What is the probability of obtaining a number less than 3?

A. $\frac{1}{6}$ B. $\frac{1}{3}$ C. $\frac{2}{3}$ D. $\frac{5}{6}$

18. If h (m+n) = m (h+r) find h in terms of m, n and r,

a. $h = \frac{mr}{2m+n}$ b. $h = \frac{mr}{n+m}$ c. $h = \frac{mr}{n}$ d. $h = \frac{m+n}{m}$

19. Which of the following is/are not the interior angle(s) of a regular polygon?

I. 108^0 II. 116^0 III. 120^0

A. I only B. II only C. III only D. I and III only.

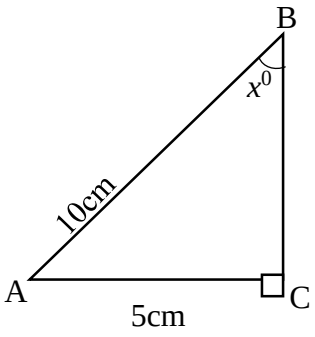
20. Find the value of x which satisfies the equation $5(x-7) = 7-2x$

A. $x = 6$ B. $x = 2$ C. $x = 14$ D. $x = 4$

21. A ladder, 6cm long, leans against a vertical wall at an angle 53^0 to the horizontal. How high up the wall does the ladder reach?

A. 3.611m B. 4.521m C. 7.962m D. 4.792m

22.



What is the size of the angle x in the diagram above?

A. 15^0

B. 60^0

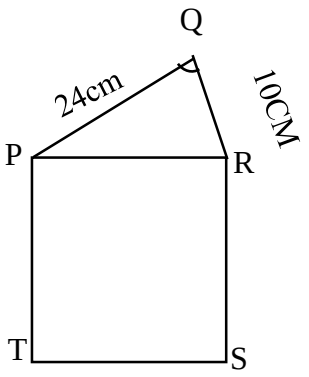
C. 30^0

D. 45^0

23. If $\frac{1}{2x} + 2y = 3$ and $\frac{3}{2x} - 2y = 1$, find (x+y).

A. $\frac{2}{3}$ B. $\frac{4}{3}$ C. $\frac{3}{2}$ D. 0

24.



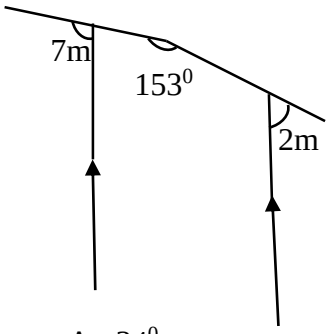
In the diagram, PRST is a square if |PQ| = 24cm, |QR|= 10cm and $\angle$PQR =90^0; find the perimeter of the polygon PQRST.

A. 112cm B. 98cm C. 86cm D. 86cm

25. If x^o is obtuse, which of these statements is correct?

A. $x > 90^0$ B. $180^0 < x < 270^0$ C. $x < 90^0$ D. $90^0 < x < 180^0$

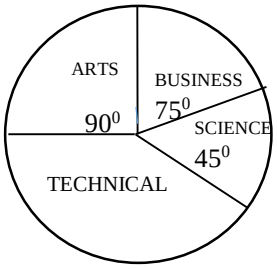
26. Find the value of *m* in the diagram below.



A. 34^0
B. 27^0
C. 23^0
D. 17^0

27. Points X and Y are respectively 12 km north and 5 km east of point Z. Calculate |XY|.

A. 17 km B. 13 km C. 14 km D. 11 km



The pie chart above shows the distribution of 600 Mathematics textbook for Arts, Business, and Science and Technological classes. Use it to answer question 28 and 29.

28. How many textbooks are for the technical classes?

A. 100

B. 150

C. 200

D. 250

29. What percentage of the total number of textbooks belongs to science?

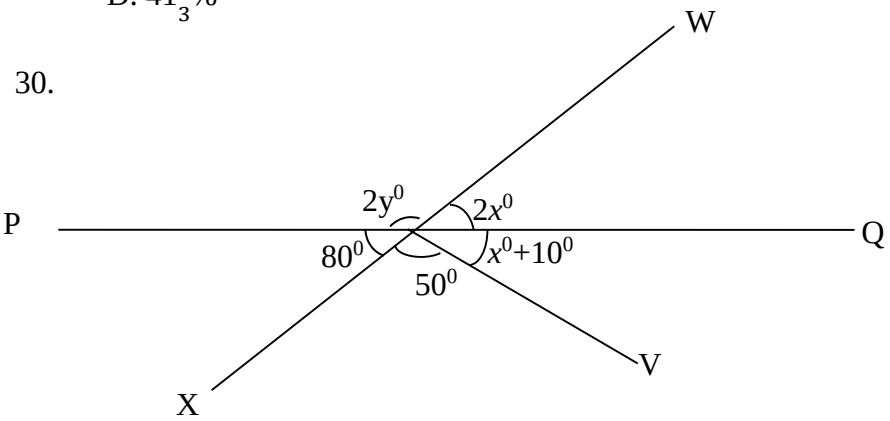
A. 12 ½%

B. $20\frac{5}{6}\%$

C. 25%

D. $41\frac{2}{3}\%$

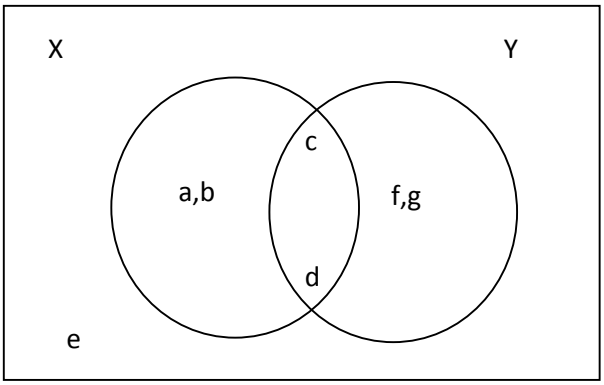
30.



In the diagram, PQ is a straight line. Calculate the value of the angle labeled 2y

A. 130^0
B. 120^0
C. 110^0
D. 100^0

31.



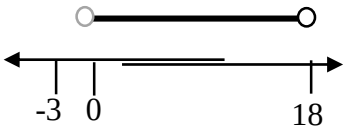
Using the Venn diagram above, find $n(X \cap Y')$

A. 2
B. 3
C. 4
D. 6

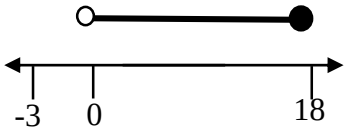
32. Which of the following number lines represents the solution to the inequality

$-9 \leq \frac{2}{3}x - 7 < 5$?

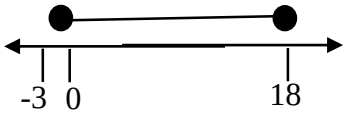
A.



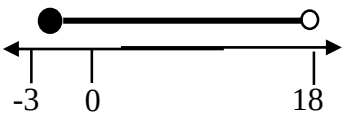
B.

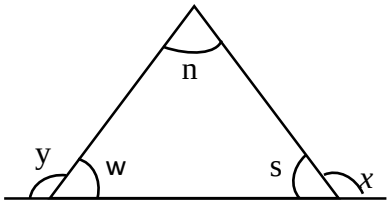


C.



D.



33. 

In the diagram above, the value of x + y = 220^0. Find the value of n.

A. 20^0

B. 40^0

C. 60^0

D. 80^0

34. Two circles have radii 16cm and 23cm. What is the difference between their circumferences? ($\pi = \frac{22}{7}$).

A. 44.05cm B. 4.44cm C. 44.00cm D. 4.10cm

35. If X= { 0,2,4,6}, Y = { 1,2,3,4} and Z = { 1,3} are subsets of

U ={x:$0 \leq x \leq 6$} find X ∩ (Y U Z).

A. {0, 2, 5} B. {1, 3} C. {2, 5} D. { }

36. If a regular polygon has 9 sides, what is the size of one its exterior angles?

A. 20^o B. 40^o C. 90^o D. 140^o

37. If tan x = 1, evaluate $\sin x + \cos x$. Leave your answer in two decimal places.

A. 2.41 B. 1.41 C. 1.51 D. 1.46

38. Simplify: $\frac{3x-y}{xy} - \frac{2x+3y}{2xy} + \frac{1}{2}$

A. $\frac{4x+5y-xy}{2xy}$ B. $\frac{5x-4x+xy}{2xy}$ C. $\frac{5x+4x-xy}{2xy}$ D. $\frac{4x-5y+xy}{2xy}$

39. Factorize: $(2x+3y)^2 - (x-4y)^2$

A. (3x-y)(x+7y) B. (3x+y)(2x-7y) C. (3x+y)(x-7) D. (3x-y)(2x+7y)

40. Make u the subject of the formula, $E = \frac{m}{2g}(v^2 - u^2)$

A. u= $\sqrt{v^2 - \frac{2Eg}{m}}$

B. u= $\sqrt{\frac{v^2}{m} - \frac{2Eg}{m}}$

C. $u = \sqrt{v - \frac{2Eg}{m}}$

D. $u = \sqrt{\frac{2v^2Eg}{m}}$

ANSWERS TO THE MATHEMATICS PERFORMANCE TEST (MPT)

1. C	2.A	3.C	4.D	5.C	6.C	7.B	.8.D	9.C	10.A
11. B	12.B	13.D	14.C	15.D	16.B	17.B	18.C	19.B	20.A
21. D	22.C	23.A	24.A	25.D	26.D	27.B	28.D	29.A	30.D
31. A	32.D	33.B	34.C	35.C	36.B	37.B	38.D	39.A	40.A

Table1: Percentage of students in Nigeria that obtained credit and above (A1- C6) pass and below (D7- F9) in the May/June WASSCE in general Mathematics between 2007 and 2016 years.

YEAR	Total No. Who Sat	No. of Students that Obtained Credit & Above (A1-C6)	% of Students with Credit & Above (A1- C6)	No. of Students with (D7- F9)	% of Students with (D7- F9)
2007	1,275,330	198,441	15.56	1,076,889	84.44
2008	1,369,142	314,903	23.00	1,054,239	77.00
2009	1,373,009	425,633	31.00	947,376	69.00
2010	1,351,557	453,447	33.55	898,110	66.45
2011	1,540,250	587,630	38.93	952,620	61.07
2012	1,675,224	819,390	49.00	852,834	51.00
2013	1,543,683	555,726	36.00	987,957	64.00
2014	1,692,435	529,732	31.30	1,162,703	68.70
2015	1,593,442	544,638	34.18	1,048,804	65.82
2016	1,544,234	597,310	38.68	946,924	61.32

Source: Test Development Division, West African Examination Council (WAEC) Lagos, Nigeria.

Table 2: Percentage of students in Nigeria that obtained credit and above (A1- C6) pass and below (D7- F9)

YEAR	Total No. Who Sat	No. of Students that Obtained Credit & Above (A1 - C6)	% of Students with Credit & Above (A1- C6)	No. of Students with (D7- F9)	% of Students with (D7- F9)
1991	294,079	32,727	11.10	261,352	88.90
1992	361,506	79,026	21.90	282,480	78.10
1993	491,755	53,559	10.90	438,196	89.10
1994	518,118	83,192	16.10	434,926	83.90
1995	462,273	76,080	16.50	386,193	83.50
1996	514,342	51,587	10.00	462,755	90.00
1997	616,923	47,252	7.70	569,671	92.30
1998	635,685	70,587	11.10	565,098	88.90
1999	642,819	57,858	9.00	584,961	91.00
2000	530,074	173,816	32.80	356,258	67.20
2001	843,991	350,746	41.60	493,245	58.40
2002	949,139	142,589	15.00	806,550	85.00
2003	518,516	237,377	45.80	281,139	54.20
2004	1,051,246	565,570	53.80	485,676	46.20
2005	1,091,763	388,122	35.55	703,641	64.45
2006	1,184,223	472,979	39.94	711,244	60.06
2007	1,275,330	198,441	15.56	1,076,889	84.44
2008	1,369,142	314,903	23.00	1,054,239	77.00
2009	1,373,009	425,633	31.00	947,376	69.00
2010	1,351,557	453,447	33.55	898,110	66.45
2011	1,540,250	587,630	38.93	952,620	61.07
2012	1,675,224	819,390	49.00	852,834	51.00
2013	1,543,683	555,726	36.00	987,957	64.00
2014	1,692,435	529,732	31.30	1,162,703	68.70
2015	1,593,442	544,638	34.18	1,048,804	65.82
2016	1,544,234	597,310	38.68	946,924	61.32
		Mean (%)	**27.31**	Mean (%)	**72.69**

Source: Test Development Division, West African Examination Council (WAEC) Lagos, Nigeria.

APPENDIX II**:** Table of Item Specification

Content level Areas	**Knowledge level 25%**	**Comprehensive level 22.5%**	**Application level 27.5%**	**Analysis level 25%**	**Total100 %**
Algebra	36,6,12	39,32	13,40	18,23,20	10
Geometry	1,2	24,26,33	3,9,30	4,22	10
Trigonometry	5,19,36	27,34	7,8,21	25,37	10
Statistics	15,17	10,11	14,31,35	16,18,29	10
Total	**10**	**9**	**11**	**10**	**40**

APPENDIX III: NAMES OF VALIDATORS

1. Dr. A. A. Momoh
2. Dr. S. Musa
3. Prof. A.U. Okoronka

APPENDIX IV: REQUEST FOR VALIDATION

Department of Environmental and life Sciences Education,
School of Technology and Science Education,
Modibbo Adama University of Technology, Yola
10th October, 2018.

Sir/ Madam,

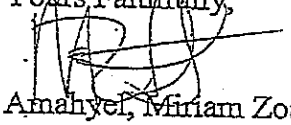
REQUEST FOR VALIDATION OF AN INSTRUMENT

I am a postgraduate student conducting a research on "Differential students' Academic performance in the senior secondary school four mathematics curriculum content areas based on gender and school factors in Adamawa State.

Your views are required for validating the research Instrument developed for this study. Please help me scrutinize the questionnaire in terms of comprehensiveness and relevance for the stated purpose. Any other suggestions for improving the instruments for data collection on the topic will be highly appreciated.

Thanks for your anticipated cooperation.

Yours Faithfully,



Amahyel, Miriam Zoaka
M.TECH / SCI / 16 / 08 67