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COMPARATIVE STUDY OF PERFORMANCE OF MALE AND FEMALE STUDENTS IN MATHEMATICS IN CO-EDUCATIONAL SECONDARY SCHOOL IN ONITSHA EDUCATION ZONE OF ANAMBRA STATE

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ABSTRACT

This study was designed to diagnose male and female students' performance in Mathematics in co-educational secondary school in Onitsha North and South local government area of Anambra state. The study centered its review of related literature on task factor on gender difference in mathematics performance, environmental factor as well as process factors in teaching mathematics. This study will be guided by 3 purposed of the study, 3 research questions and 3 hypotheses. The review of the related literature was done conceptual framework, theoretical framework, theoretical study, empirical study and summary of review of the related literature. The gender dynamics theory by John Money in 1955 will also guides this study. This study will adopt a quasi – experimental research design (Facto Analysis). The population of the study will be 3,876 SS2 mathematics students in the 13 government own coeducational secondary school in Onitsha North and South LGA. The sample for the study will 160 SS2 mathematics students selected from the selected secondary schools out of the 13 government own coeducational secondary school in Onitsha North and South LGA. Mathematics performance test (MPT) will be the instrument used for data collection. Three experts validated the instrument to show the validity of the instrument. A pilot study was done

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using Community Secondary School Oba in Idemili education zone with 0.75 reliability co-efficient. The Average, percentage and measures of relationship were used as approach to data analysis at .05 level of significant. Mathematics Performance Test (MPT) was used for data collection. The instruments were validated by three expects. Kuder- Richardson (K-R 21) was used to determine the reliability coefficient of MPT which was found to be 0.75. The experimental procedure was done using the stages in MPT in treatment groups and other stages. Mean and standard deviation were used to answer the research questions while analysis of covariance was used to test the null hypotheses at 0.05 alpha levels. The findings of the study revealed among others that, sex disparity in mathematics among male and female is rooted in inequalities at the secondary school level in Onitsha North and South local government area of Anambra state. Hence, the results of this study also shows that there is a significant difference between the performance of male and female students on geometric progression, algebraic process, factorization, arithmetic progression, logarithm and inequalities. Base on the findings it was recommended that female mathematics students need encouragement to pursue mathematical courses and to stand up against discrimination and harassment. They also need to be made aware of the opportunities open to students in all mathematical courses. Government should also provide enough and qualified mathematics teachers in the state at large. The school Guidance and Counselors should through the help of government and nongovernmental organizations (NGOs) establish crises intervention centers (CIC) to help the drop – out girls and bettered abandoned female students.

Keywords: Performance; Gender; Student; Mathematics; Co-Educational School.

Introduction

Students' poor performance in Senior Secondary Certificate Examination (SSCE) conducted by both the West African Examination Council (WAEC) and the National Examination Council (NECO) (Eze, 2017) is really disturbing especially that educationists now emphasis much on educational accountability. It is worthwhile to reiterate on the role and function of English language and mathematics in Nigeria as that which warrants concern when students' performance in it is poor.

Mathematics and English language are used as the medium of instruction and in learning other subjects in all Nigerian educational institutions. Equally too, no student is qualified for admission into the Nigerian universities and other tertiary institutions without scoring a credit pass in mathematics and English language in addition to other four subjects in the Senior Secondary Certificate Examination (SSCE) conducted by the West African Examination Council (WAEC) and the National Examination Council (NECO). One other serious issue worthy of note at this point of discourse is that, in Nigeria today, during the placement of students into either schools or classrooms to enhance better performance, the factors mostly considered are ability, aptitude,

occupation or trade or career choice, science or arts inclination but always at the exclusion of gender streaming factor. Where and when gender comes to mind, it is a haphazard exercise. It is neither based on policy guideline or research report nor bearing in mind academic performance benefit but on grounds of morality or religious injunctions or obligations. This inequity between female and male includes their educational opportunities, low level of enrollment, alarming withdrawal rate resulting in low completion rate, poor or lack of attention and support for the girl-child education, unequal attention given to males and females students especially in coeducational classrooms among others.

In addition, the assertion that females have better aptitude and competence in learning language than their male counterparts and the availability of controversial and inconsistency of results of studies on the academic performance of both female and male students' performance when they are streamed according to gender is academically challenging to have prompted this study. Positive study results on gender streaming include those by Lee and Lockheed (1990); Mallam (2016), Kurumeh, Igyu and Mohammed (2023); Bosire, Mondohand Barmao, (2018); Sax, (2017) etc and unfavorable study results include those of Rowe (2018); Oludipe (2022); Kang'ahi, (2022); Pahlke, E., Hyde, J. S. Allison, C. M. (2019) etc. Therefore, this study is aimed at curbing the high rate of students' failure in mathematics education in West Africa Examination Council (WAEC) and National Examination Council (NECO) Senior Secondary Certificate Examinations in Niger State, Nigeria when implemented.

Mukhtar and Iliyasu (2016) were on the view that "in most mathematics and mathematics related fields, there tend to be more male than females. For instance, when we look at the ancient mathematicians including; Pythagoras, Thales, Euclid and Pascal, all of them were men''. However, one begins to ask on the possible causes of such imbalance between male and female could it be female's brain are weaker than those of males? According to Blasser (2017) "girls and boys start equal in mathematics and science performance in school, they appear to do equally well in both subject in elementary schools. Then some girls begin to lose interest in mathematics and science around the age of twelve. These girls then drop out from Mathematics Classes often forever closing the door on many career opportunities''.

Mathematics occupies central position in education because mathematics is a science and the nucleus of all other sciences, which lays strong emphasis on both theory and practical. Mathematics is also called the science of reasoning. There were a few premises on which we based our reasoning. Reasoning in Mathematics is of two types: Inductive and deductive. When statements containing mathematical truths were based on general observations and experience, reasoning is called inductive whereas deductive type the statements are products of mind. The

method of teaching is very important for teacher of any subject generally and for the mathematics teacher particularly. Method is nothing but a scientific way of presenting the subject, keeping in mind the psychological and physical requirements of the children. For effective learning of mathematics, the method has to be as good as the content. It is through method only that it is possible to make a subject interesting and useful. While teaching a set of pupils with varying interests, aptitudes and attitudes, one should be aware of the psychological basis of teaching learning process. Communication of ideas and development of concepts in a precise manner based on a logical development of subject is the most important pre-requisite in teaching a subject like mathematics. Generally, students were afraid of studying mathematics, as there are various reasons for that method being one of them. Pupils tend to learn mathematics through a meaningful approach rather than by a mechanical process. Education has any aspects e.g., learning, guidance and counseling, evaluation, teaching and testing. Testing is a process for accurate evaluation. An instrument used for testing is called test (Eze, 2017).

This show that female's student performed less than their counterparts, males. However, student's performance is not dependent on sex difference and this leads to continue verification and study on males and 13 female's performances in Mathematics in Nigeria. Nigeria is aware of the need to become self-reliant technologically and scientifically. Therefore, attention has to be given to Mathematics as the language of science. National Policy on Education (NPE) (2016) states that "there will be equal educational opportunities for all". It was discovered that, the female's gender that forms about 48% of the Nigerian population census (2016) was not found in the school. This was due to societal pressure on females such as early marriage, distribution of girls from schooling by other factors.

Bandele (2018) revealed that "the differences in students' performance are always attributed to environmental or process variables. This is in line with section 18 sub sections 1 and 3 of the Nigerian constitution which guarantees education as a right for every Nigerian child". In realization of the importance of mathematics, science and technology, the NPE stipulates that "Education will be used as an instrument for scientific, technological and cultural development of the society". Oladunni (2015) opined that "there was no significant difference between achievement of males and females in mathematics". Mukhtar and Iliyasu (2016) were on the view that "in most mathematics and mathematics related fields, there tend to be more male than females. For instance, when we look at the ancient mathematicians including; Pythagoras, Thales, Euclid and Pascal, all of them were men''. However, one begins to ask on the possible causes of such imbalance between male and female could it be female's brain are weaker than those of males?

According to Blasser (2021) "girls and boys start equal in mathematics and science performance in school, they appear to do equally well in both subject in elementary schools. Then some girls begin to lose interest in mathematics and science around the age of twelve. These girls then drop out from Mathematics Classes often forever closing the door on many career opportunities''. This show that female's student performed less than their counterparts, males. However, student's performance is not dependent on sex difference and this leads to continue verification and study on males and female performance in Mathematics. Hence, the current study will investigate the comparative study of performance of male and female students in mathematics in co-educational.

Sex disparities in mathematics education, is like geographical disparities have historically been prevalent in almost all societies and in different aspect of learning. Male students fell that they can solve mathematics more than female students and female students fell that they cannot compete with their counterpart male students in learning Mathematics. However, the gender differences in Mathematics lead to our male and females to become backward unsuccessful personals in the area of science and technology. Many researches were conducted in the field of gender issues on mathematics and still reported that there is a gap between males and females. There is need to encourage females not to fear mathematics in their life and make it simple for them to become self-reliant, self-esteem, take care of their family and equated with wider knowledge in science and technology. In fact, the present study will be "comparative study of performance of male and female students in mathematics in co-educational secondary school in Onitsha Education Zone of Anambra State.

Aim of the Study

The main objective of this study was to compare the performance of male and female students in mathematics in co-educational secondary school in Onitsha Education Zone. Specifically, the study intends to:

1. Investigate the differences between the performance of male students and that of female students in co-educational secondary school mathematics in Onitsha North Education Zone.
2. Find out extent of the differences between genders (male and female) affect academic performance of mathematics students in the co-educational secondary schools in Onitsha Education Zone.
3. Assess the impact of teaching methods and classroom participation on mathematics performance of male and female students in Onitsha Education Zone.
4. Explore socio-cultural and psychological factors (such as parental support, peer influence or gender stereotypes) influence mathematics

performance by gender in Onitsha Education Zone.

5. Evaluate the role of school related factors, such as teacher gender, classroom environment and access to learning resource on male and female students' performance in mathematics in Onitsha Education Zone.

Scope of the Study

The study was delimited to coeducational secondary school male and female students in Onitsha North and South Government areas in Anambra state. It covered coeducational senior secondary school male and female mathematics students. Male and female senior students will be used because they are preparing to take internal and external examination which lead to poor academic achievements of male female students. The study was limited to the assessing comparative study of academic performance of male and female students in mathematics in co-educational secondary school in Onitsha Education Zone of Anambra State.

Research Questions

The following research questions guided the researcher during the course of this research to achieve the specified objectives above:

1. What are the differences between the academic performance of male students and that of female students in co-educational secondary school mathematics in Onitsha Education Zone?
2. To what extent does the difference between genders (male and female) affect academic performance of mathematics students in the co-educational secondary schools in Onitsha Education Zone?
3. What is the impact of teaching methods and classroom participation on mathematics performance of male and female students in Onitsha Education Zone?
4. What are the socio-cultural and psychological factors (such as parental support, peer influence or gender stereotypes) influence mathematics performance by gender in Onitsha Education Zone?
5. What is the role of school related factors, such as teacher gender, classroom environment and access to learning resource on male and female students' performance in mathematics in Onitsha Education Zone?

Hypotheses

The following hypothesis guided the study

HO_1: There is no significant difference between the academic performance of male and female students in co-educational secondary schools' mathematics in Onitsha Education Zone.

HO_2: There is no significant difference on the extent of the differences between genders (male and female) on academic performance of mathematics students in the co-educational secondary schools in Onitsha Education Zone?

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HO_3: There is no significant difference between the impact of teaching methods and classroom participation on mathematics performance of male and female students in Onitsha Education Zone?

HO_4: There is no significant difference between the socio-cultural and psychological factors (such as parental support, peer influence or gender stereotypes) that may influence mathematics performance by gender in Onitsha Education Zone?

HO_5: There is no significant difference between the role of school related factors, such as teacher gender, classroom environment and access to learning resource on male and female students' performance in mathematics in Onitsha Education Zone?

Methods

The study adopted correlational study specifically; a nonrandomized pretest and post-test control group design was used. Correlational research design is a research design that is aimed to establish a cause-and-effect relationship between an independent and dependent variable. The study was carried out in Onitsha Education Zone (North and South local government areas) in Anambra state. The population for this study covered three thousand eight hundred and seventy-six (3,876) students within the population as at 2023/2024 academic session. The sample for the study consists of 160 SS2 mathematics students drawn from three schools out of 13 Co-educational secondary schools in Onitsha Education Zone, with average age of 15 years.

The researcher used the mathematics performance test (MPT) to obtain the difference in performance between male and female students in Senior Secondary School mathematics. The instrument was face and content validated by three lecturers. Two were from Department of Science Education in Nnamdi Azikiwe University, Awka while the other one was from the Unit of Measurement and Evaluation, Department of Educational Foundation, Faculty of the Education, Nnamdi Azikiwe University, Awka. To test the reliability of the instrument, a pilot study was conducted using Community Secondary School Oba in Idemili Education Zone which obtain a reliability co-efficient of r=+0.60, rcc=0.75 for the performance test. Which prove that, the instrument is reliable for the study. The researcher used the mathematics performance test (MPT) to obtain the difference in performance between male and female students in Coeducational Secondary School mathematics. Pearson Product Moment correlation co-efficient was used to obtain r and substitute it in the spilt half method to obtain the reliability co-efficient.

The null hypotheses were tested at 0.05 alpha level using Analysis of Covariance (ANCOVA). ANCOVA were used to remove bias, which may be resulting from using intact groups whose equivalence on certain measures has been fully

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determined. The decision rule was that a null hypothesis was rejected where the p-value is less than or equal to 0.05 ($p \leq 0.05$), but if p-value is greater than 0.05 ($p > 0.05$), the null hypothesis was not be rejected.

Table 1: Mean and Standard Deviation of male and female students' academic performance scores in co-educational secondary schools' mathematics in Onitsha Education Zone.

		Pretest		Posttest		
Gender	N	Mean	SD	Mean	SD	Mean Gain
MALE	83	11.57	3.80	24.81	2.18	13.24
FEMALE	77	9.96	2.60	22.11	2.23	12.15

The result presented in Table 1 reveals the pretest and posttest male and female students scores. The pretest means of male students' ability scores for the and female students are 11.57 and 9.96 with standard deviation scores of 3.80 and 2.60 respectively. The posttest mean of male and female students ability scores are 24.81 and 22.11 with standard deviation scores of 2.18 and 2.23. The standard deviation scores for the pretest for both groups were higher than the standard deviations for the posttest. This suggests more variability in the pretest mean male student scores of the students than the posttest mean female student scores. More of the scores near the mean in the pretest than in the post test. Since the pretest mean mental ability score is smaller than the posttest means mental ability score, in both groups, which means that male students performed better than female student in the mathematics examination in Onitsha Education Zone.

Table 2: Mean and Standard Deviation Scores of extent difference in gender affect academics performance of Mathematics Students in the co-educational secondary schools in Onitsha Education Zone.

		Pretest		Posttest		
Gender	N	Mean	SD	Mean	SD	Mean Gain
Onitsh North						
MALE	43	12.58	4.35	25.52	2.04	12.94
FEMALE	37	10.88	3.2	24.33	2.15	13.45
Onitsha South						
MALE	43	9.7	2.71	22.93	2.14	13.23
FEMALE	42	10.15	2.51	21.43	2.83	11.28

The result presents in Table 2 reveal the academic performance scores of male and female students in Onitsha Education Zone. The pretest means scores of male and female students for the groups in the Onitsha North and South are 12.58, 10.88, 9.7 and 10.15 with standard deviation scores of 4.35, 3.2, 2.71 and 2.51. The posttest means performance ability scores of male and female students for the groups in Onitsha North and South are 25.52, 24.33, 2.14 and 2.83 with standard

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deviation scores of 2.04, 2.15, 2.14 and 2.83. The standard deviation scores for the pretest mean performance scores for male and female students in both groups were higher than the standard deviations posttest mean performance. This suggests more variability in the pretest mean performance scores of the male and female students than their posttest mean performance scores. More of the scores near the mean in the pretest than in the post test. Since the posttest mean academic performance scores of female students are less than that of their male counterpart in both groups in the Mathematics in the favours male students performance than their female counterpart in coeducational secondary school in Onitsha Education Zone.

Table 3: Mean and Standard Deviation Academic Performance Scores of male and female Students in co-educational secondary schools in Onitsha Education Zone.

		Pretest		Posttest		
Gender	N	Mean	SD	Mean	SD	Mean Gain
Male	85	19.37	6.02	38.93	6.00	19.56
Female	75	18.52	5.52	36.65	4.83	18.13

The result presented in Table 3 reveals the mean differences in performance scores of students male and that of female students. The pretest mean performance scores for the groups in the male and female are 19.39 and 18.52 with standard deviation scores of 6.02 and 5.52 respectively. The posttest mean performance scores are 38.93 and 36.65 with standard deviation scores of 6.00 and 4.83. The standard deviation scores for the pretest for both groups were higher than the standard deviations for the posttest. This suggests more variability in the pretest mean performance scores of the students than the posttest mean academic performance scores. More of the scores near the mean in the pretest than in the post test. Since the pretest mean performance score in is smaller than the posttest mean performance score, in both groups, this suggested that male students improves academic performance in co-educational secondary schools in Onitsha Education Zone.

More so, the mean gain performance scores of male and female students are 19.56 and 18.13 which depicts that the male students in the Onitsha South have higher academic performance scores than their female in same area.

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Table 4: Mean and Standard Deviation Academic Performance Scores of socio-cultural and psychological factors (such as parental support, peer influence or gender stereotypes) that may influence mathematics performance by gender in Onitsha Education Zone.

		Pretest		Posttest		
Gender	N	Mean	SD	Mean	SD	Mean Gain
Onitsha North	85					
Male	38	12.58	4.35	25.52	2.04	12.94
Female	47	10.88	3.20	24.33	2.15	13.45
Mean Difference		1.70		1.19		0.51
Onitsha South	75					
Male	35	9.7	2.71	22.93	2.14	13.23
Female	40	10.15	2.51	21.43	2.83	11.28
Mean Difference		0.45		1.50		1.95

The result presented in Table 4 reveals the mean mental ability scores of male and female students socio-cultural and psychological factors (such as parental support, peer influence or gender stereotypes) and those taught using influence mathematics performance by gender in Onitsha Education Zone. The pretest mathematics performance scores of male and female students for the groups are 12.58, 10.88, 9.7 and 10.15 with standard deviation scores of 4.35, 3.2, 2.71 and 2.51. The posttest means mathematics performance scores of male and female students for the groups are 25.52, 24.33, 2.14 and 2.83 with standard deviation scores of 2.04, 2.15, 2.14 and 2.83. The standard deviation scores for the pretest mean mathematics performance scores for male and female students were higher than the standard deviations posttest mean mathematics performance. This suggests more variability in the pretest mean mathematics performance scores of the male and female students than their posttest mean mathematics performance scores. More of the scores near the mean in the pretest than in the post test. Since the posttest mean mathematics performance scores of female students are less than that of their male counterpart in both groups in the Mathematical concept taught, treatment group and control group favours male students mathematics performance than their female counterpart in mathematics.

Table 5: Mean and Standard Deviation Academic Performance Scores of the role of school related factors, such as teacher gender, classroom environment and access to learning resource on male and female students' performance in mathematics in Onitsha Education Zone.

		Pretest		Posttest		
Gender	N	Mean	SD	Mean	SD	Mean Gain
Male	85	19.37	6.02	38.93	6.00	19.56
Female	75	18.52	5.52	36.65	4.83	18.13
Mean Difference		0.85		2.28		1.43

The result presented in Table 5 reveals the mean differences in achievement scores of students taught mathematics of the role of school related factors, such as teacher gender, classroom environment and access to learning resource on male and female students performance in mathematics in Onitsha Education Zone. The pretest mean achievement scores for the gender in the school relation factors and classroom environment are 19.39 and 18.52 with standard deviation scores of 6.02 and 5.52 respectively. The posttest mean achievement scores are 38.93 and 36.65 with standard deviation scores of 6.00 and 4.83. The standard deviation scores for the pretest for both groups were higher than the standard deviations for the posttest. This suggests more variability in the pretest mean achievement scores of the students than the posttest mean achievement scores. More of the scores near the mean in the pretest than in the post test. Since the pretest mean achievement score was smaller than the posttest mean achievement score in both groups, the treatment which is the school relation factors improves students' academic achievement in number and numeration than the classroom environment.

Table 6: The T-test Results of Academic Performance Ability Scores of Male and Female Students in the Onitsha Education Zone based on Gender

Gender	No sat	No pass	Mean	S.D	T cri	T cal	P	D.F
Male	20	17	54.30	11.27	0.80	0.25	0.05	38
Female	20	14	53.15	17.01	0.80	0.25	0.05	

Table 6: Shows that male students have higher mean scores of 54.30 and standard deviation of 11.27. Female students have the smaller mean scores of 53.15 and standard deviation of 17.01. However, T-calculated is 0.25 and T-critical is 0.80 which implies that the null hypothesis is accepted. In all, the null hypothesis which stated there is no significance difference between the academic performance of male and female students in co-educational secondary school mathematics in Onitsha North and South LGA is accepted. Hence, there is no significance difference between the academic performance of male and female students in co-educational secondary school mathematics in Onitsha Educational Zone.

Table 7: The T-test Results of Academic Performance Scores among the Mathematics Male and Female Students in Onitsha Education Zone.

Gender	No. sat	No Pass	Mean	S.D	T cri	T cal	P	D.F
Male	83	80	64.3	10.1	0.02	2.52	0.05	38
Female	77	66	53.2	17.0	0.02	2.52	0.05	38

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Table 7 above shows that male students had the highest means scores of 64.3 and standard deviation of 10.1. Female students had the lowest mean scores of 53.2 and standard deviation 17.0. Therefore, t-calculated is 2.52 and t-critical is 0.02 and hence the null hypothesis is rejected. Because the calculated value for t is higher than that of critical value.

Table 8: The T-test Results of Academic Performance Scores on the teaching methods and classroom participation on mathematics performance of male and female students in Onitsha Education Zone

Gender	No. sat	No pass	Mean	S.D	T cri	T cal	P	D.F
Male	83	80	64.3	10.1	0.02	2.52	0.05	38
Female	77	66	53.2	17.0	0.02	2.52	0.05	38

Table 8 above shows that male students had the highest means scores of 64.3 and standard deviation of 10.1. Female students had the lowest mean scores of 53.2 and standard deviation 17.0. Therefore, t-calculated is 2.52 and t-critical is 0.02 and hence the null hypothesis is accepted. Because the calculated value for t is not higher than that of critical value.

Table 9: The T-test Results of Academic Performance Scores among the socio-cultural and psychological factors (such as parental support, peer influence or gender stereotypes) that may influence mathematics performance by gender in Onitsha Education Zone.

Gender	No sat	No pass	Mean	S.D	T cri	T-cal	P	D.F
Male	85	83	5.30	15.27	0.72	0.35	0.05	28
Female	75	74	51.15	19.01	0.72	0.35	0.05	

The data presented in Table 9 shows the ANCOVA results in the mean academic achievement scores of male and female students taught mathematics of the socio-cultural and psychological factors (such as parental support, peer influence or gender stereotypes) that may influence mathematics performance by gender in Onitsha Education Zone. The results reveal no significant difference in the mean academic achievement scores of male and female students taught mathematics of parental support, peer influence or gender stereotypes (TTA) F (51.15) = .579, p = .072 > .05, η^2_p = .035. Therefore, the null hypothesis is not rejected. Hence, the result shows that there is no significant difference between the mean academic achievement scores of male and female students taught mathematics of parental support, peer influence or gender stereotypes and those of the academic achievement.

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Table 10: The T-test Results of Academic Performance Scores of the role of school related factors, such as teacher gender, classroom environment and access to learning resource on male and female students' performance in mathematics in Onitsha Education Zone.

Gender	No sat	No pass	Mean	S.D	T cri	T cal	P	D.F
Male	85	84	54.30	11.27	0.86	0.25	0.05	48
Female	75	75	53.15	17.01	0.86	0.25	0.05	

Data shown in Table 10 reveals the ANCOVA results on the role of school related factors, such as teacher gender, classroom environment and access to learning resource on male and female students' performance in mathematics in Onitsha Education Zone. The results show a significant difference F (1, 277) = 11.27, p = .0015 .05, η^2_p = 17.01 in the mean achievement scores of the students taught mathematics classroom environment and access to learning resource on male and female students' performance. In all, the null hypothesis which stated there is no significant difference between the mean achievement scores of students taught mathematics classroom environment and access to learning resource on male and female students' performance is rejected. Hence, there is significant difference between the mean achievement scores of students taught the role of school related factors, such as teacher gender, classroom environment and access to learning resource on male and female students' performance in mathematics in Onitsha Education Zone.

Then, various statistical data were used for the computation or comparative analysis. The number of students sat, number 0f students pass, standard deviation, mean were used for descriptive analysis, and t-cal. And t-cri. 0.05 levels of significant rejection decisions were taken on the retention or rejection of the null hypothesis. Therefore, the descriptive analysis further shows the difference in performance of such school as well as males of one school compared to that of another. The study also shows the analysis of the content area and the entire null hypothesis were rejected expert that of table 2, 4 and 5. Generally, both male and female students performed well in geometric progression and algebraic process, factorization, arithmetic progression, logarithm and inequalities.

Discussion of the Findings

The finding has shown that performance of male students and that of female students in co-educational secondary schools in Mathematics concept have higher score than their counterparts in other teaching method. The difference may be as a result of the fact that male students increase in structured thinking, supports creative and personalized reports among individual irrespective of gender. The finding of the study in consonance with Nwagwu (2017) who observed that Biology female students in co-educational secondary school had a higher ability score than their male counterpart but the both gender had a high ability score than their counterparts in

control school. From table 1 male and female scores in the school is higher than their counterpart scores in other school.

Also, the ANCOVA analysis indicated that there is no significant difference between the performance of male students and theat of female students in co-educational secondary school mathematics in Onitsha education Zone. The findings of this study is not surprising because both performance of male and female co-educational secondary school students' ability in Mathematics concept improved ability skills score was found in co-educational school in Onitsha Education Zone was not significant.

The finding has shown that genders (male and female) affect academic performance of mathematics students in the co-educational secondary schools in Onitsha Education Zone. The difference may be as a result of the fact that affect academic performance of mathematics students in the co-educational secondary schools is based on gender. The finding is in line with Chiketa and Okigbo (2021) who observed that students' academic performance of mathematics students in the co-educational secondary schools is based on using conventional approach as a result of improved communication the teaching method and the report of Cassidy, (2016) who revealed that differences between genders (male and female) affect academic performance of mathematics students in the co-educational secondary schools in Mathematics than conventional method.

Also, the ANCOVA analysis indicated that there is no significant differences between genders (male and female) affect academic performance of mathematics students in the co-educational secondary schools. The finding is in line with Meenu Der, (2016) revealed that there is a great significant in differences between genders (male and female) affect academic performance of mathematics students in the co-educational secondary schools. The significant in academic achievement among students taught mathematics using male and that of female in the mathematics concept. Hence, one would be in a position to say that the students' differences between genders (male and female) affect academic performance of mathematics students in the co-educational secondary schools in Onitsha Education Zone.

The finding has shown that teaching methods and classroom participation on mathematics performance of male and female students in Onitsha Education Zone. The difference may be as a result of the fact that teaching methods and classroom participation on mathematics performance of male and female students in Mathematics concepts. This finding is not in consonance with Okwuduba and Okigbo (2018) who observed that the teaching methods and classroom participation on mathematics performance of male and female students and Rekdal (2016) who observed that female pupils taught in both experimental groups achieved better than their male counterpart in the same group due to students' engagement in stimulating visual

presentations offered by the teaching approach in experimental groups. Similarly, the finding is not in line with groups of researchers in their different studies and fields who observed no significant differences in academic achievement among male and female students.

Also, the ANCOVA analysis indicated that there is no significant difference between the teaching methods and classroom participation on mathematics performance of male and female students. The findings of this study is not surprising because both teaching method enhanced male and female secondary school students' academic achievement in Mathematics concept enhanced students' academic achievement in mathematics concept.

The finding has shown that genders (male and female) affect academic performance of mathematics students in the co-educational secondary schools in Onitsha Education Zone. The difference may be as a result of the fact that affect academic performance of mathematics students in the co-educational secondary schools is based on gender. The finding is in line with Chiketa and Okigbo (2021) who observed that students' academic performance of mathematics students in the co-educational secondary schools is based on using conventional approach as a result of improved communication the teaching method and the report of Cassidy, (2016) who revealed that differences between genders (male and female) affect academic performance of mathematics students in the co-educational secondary schools in Mathematics than conventional method.

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This study was aimed at a comparative analysis between performance of male and female students' performance in mathematics. A mathematics performance test (MPT) was administered to (160) sample students including males and female student. However, t-test methods were used for comparison. However, findings, it was discovered that the male students performed better than their female students' counterparts who may perhaps be to the fact that male students tend to have high aptitude in learning mathematics than the female students, because it was discovered that only Table 5 appeared to be rejected in our null hypothesis. Also,

male students tend to be more dependent in the learning of mathematics while the female students tend to be independent, hence, the poor performance of female students. Therefore, effective strategies should be adopted for better improvement. The descriptive and inferential analysis of the students' performance was also carried out, hence mean standard deviation for mean difference, t-calculated, t-critical and degree of freedom was obtained. In the analysis also it was discovered that female students in mixed school tend to perform better than that of school which are not mixed. However, based on the relationship obtained above in table 4 and 6 it was discovered that most females of such relation performed better than their in-learning mathematics, because the performance of non-mixed schools may be to the fact that since there is no gender difference, hence competition tend to be minimum.

Then, various statistical data were used for the computation or comparative analysis. The number of students sat, number 0f students pass, standard deviation, mean were used for descriptive analysis, and t-cal. And t-cri. 0.05 levels of significant rejection decisions were taken on the retention or rejection of the null hypothesis.

Summary of the Findings

This study also seeks to make a comparative analysis of the performance of male and female students which were randomly selected from the selected senior secondary schools within Onitsha North and South metropolis. Consequently, some recommendations on how to bridge the gap between the performance of male and female students are made.

However, the sample students used were 160 students which were randomly selected from the secondary schools in Onitsha North South. A Mathematics performance test (MPT) was presented to each of those students which covered the factorization, algebraic process, geometric and arithmetic progression and inequality. Instructions were provided to the students on how to answer the questions and the time allowed for the test was thirty minutes. The questions, which were bio-data and multiple-choice objective (20 questions). The test had two (2) sections. Section (A) contained bio or personal data; section B contained objective questions on factorization, algebraic process, geometric and arithmetic progression and inequality. The questions were administered on the students under the supervision of the researchers and research assistance (teachers). Proper measures were taken to ensure independent work of each student. Descriptive and inferential analysis was used for the comparison of the students' performance after the test had been marked and scored by the researcher. The three hypotheses of the study were tested. Almost all schools selected were compared and analyzed using t-test independent, with 0.05 level of significance as basis of retaining or rejecting the null hypothesis, because, males and female students t-calculated and t-critical in hypotheses 5 implies that

the hypothesis is rejected. Meaning there is a significant difference.

Similarly, the performance of males and females, t-calculated and t- critical are also hypotheses 4 and 6 which is accepted the null hypothesis implying that there is a significant difference also, among others.

Conclusion

Sex disparity in mathematics among male and female is rooted in inequalities at the secondary school level. By the same token, disparities at primary school level set the stage for these at the secondary level. It follows; therefore, particular teachers have a special opportunity to affect self-esteem of their female students, by instilling confidence which will shape their interest in aspirations.

However, the result of this study shows that there is a significant difference between the performance of geometric and algebraic process. After making an inferential analysis which leads to the rejection of null hypothesis when compare to Females and Males, and taking the male and female students in Onitsha North and South coeducational secondary schools as a target study. The result of this study also shows that there is a significant difference between the performance of male and female students on geometric progression, algebraic process, factorization, arithmetic progression, logarithm and inequalities. After making an inferential analysis which lead to the rejection of hypothesis when compared with mean and standard deviation it was discovered that the study of females and male students were to be accepted.

Generally, this research study was concluded that there is a significant difference between the performance of male and female students on geometric and algebraic process, factorization, arithmetic progression, logarithm and inequalities, hence, the null hypotheses are rejected.

Recommendations

Based on the research findings, the researcher makes the following recommendations;

1. Female mathematics students need encouragement to pursue mathematical courses and to stand up against discrimination and harassment. They also need to be made aware of the opportunities open to students in all mathematical courses.
2. Public enlightenment campaign should be intensified to dispel the nation that mathematics is not for male only.
3. Seminar /workshop can be organized where women who are excelled in mathematics are invited as guest lecturers to talk about their experience in mathematics and science. They could share with the girls what challenge they faced, how they succeeded and benefited from mathematics in their lives.
4. Government should provide enough and qualified mathematics teachers in

the state at large.

5. Teachers of mathematics should therefore be encouraged to be gender-sensitive when teaching mathematics.
6. Provision of career guidance particularly for female students at secondary level should be made to encourage them to study mathematics not shy away from it.
7. Government should as a matter of urgency intervene to remove all biases and discrimination against females.
8. There should be workshops and seminars to educate women mathematically to overcome fear.
9. Teachers and parents should properly encourage right from childhood to view mathematics as very simple.
10. Mathematics and science clubs should be encouraged. However, here mathematics program for girls can be organized. The aim is to provide girls with fun and interactions over mathematics (Blosser, 1990).
11. Counselors should through the help of government and nongovernmental organizations (NGOs) establish crises intervention centers (CIC) to help the drop – out girls and bettered abandoned females.
12. Special incentives in the form of scholarship should be given to female students who undertake and excel in mathematics course as a way of encouragement in the area.

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