

## **GENDER INEQUALITY IN THE TEACHING AND LERNING OF MATHEMATICS, IMPLICATION ON THE NIGERIAN ECONOMY.**

by

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### **Abstract**

*The issue of gender inequality in the teaching and learning of mathematics takes its root from secondary schools days where students are enrolled in either science or Arts subjects, so girls preferred Arts subjects while majority of boys preferred the science subjects. Mathematics is generally regarded as an abstract science which has to do with factual thinking, memorization proofs, synthetization, organization, problem solving and solutions to peculiar issues that engulf the human day to day activities. So Nigeria with its economic challenges and the current population of the female gender which might be said to outnumber their male counterpart, should not condole paying lip service to this important subject which is capable of turning round the economy. Furthermore mathematics is thus an important means of socialization, it help an individual to understand his/her self, his/her society and shape his/her behavior. Thus it is a great instrument in solving the current Nigerian security challenges. To this end the researcher found it necessary and undertook this field work to some selected schools in Sokoto metropolis and its environ where he met with students/teachers, parents/guardians as well as the educators in the LGEA. Questionnaires were distributed and oral interview conducted, the result shows that, teachers, students, parents and educators have to be awaken if this important subject is to prosper.*

**Keywords:** *Gender inequality, Female prejudice, Economic challenge. Socio-cultural influence.*

### **INTRODUCTION**

The heavy dependence on mathematics makes it a subject that is dreaded by nearly all pupils especially girls at the secondary school level. Because of this mathematics enjoys the least popularity among the three science subjects, thereby resulting in the dearth of girls pursuing mathematics Okonkwo et al, (2002). This has often resulted in girl's low enrolment in mathematics at the various institutions of higher learning, which in fact has brought about few female teachers teaching mathematics in our secondary schools. This fact has been earlier confirmed by Ogunleye (1999) who showed that enrolment in science slims out as one moves up the mathematical ladder. Furthermore, girls under achievement in mathematics could be seen from the performance in externally conducted examinations Adeyemiet al(2008). Ogunleye (1999), have previously confirmed the underachievement of girls in science/Mathematics.

Many factors have been identified to be influencing low enrolment in secondary school sciences/mathematics. These include lack of mathematical skills possessed by students, social-cultural factor, and influence of others or peers, home background of students; perceiving mathematics as a difficult subject, low popularity index and rating among other school subjects (Ogunleye 2001). Ogunleye (1999) also identified low parental expectation, encouragement, and fewer opportunities to work with science materials and instruments and also low participation of girls in extra curricula science activities as some of the factors contributing to girls low achievement level in mathematics. All the above mentioned factors are also applicable to other science subject. In view of this, the study seeks

to identify causes of gender inequality in the teaching and learning of mathematics as well as contributing factors and the implication on the national economy. The result of this study will go a long way in addressing some of the current Nigerian economic challenge.

### **Statement of the Problem**

In spite of the potency of the female gender they have been relegated to the background as far as mathematics is concerned. Regrettably, the effort at capacitating the female through mathematics has met with little success. This is because the prejudice against women had persisted, despite the fact that women consists about half of the population of Sokoto state and Nigeria at large. There is nothing to write home about in the performance of female student in mathematics in the areas where the field work was conducted. The female gender have extremely low performance in the SSCE and NECO mathematics examinations in the last decade, making it impossible to further in mathematics and other science subjects in the nations higher institutions of higher learning. In view of this the study seek to investigate this trend and as such proffered solutions and recommendations.

### **Aim and Objective of the Study**

The aim of this study is to identify causes and the resultant effects of gender disparity in the teaching/learning of mathematics in some selected secondary schools of Sokoto state. This shall be achieved through the following objectives:

- Find out the nature of the pupils performance towards the teaching and learning of Mathematics in Tangaza L G EA of Sokoto state.
- Discover the gender inequality and its effect on the learning of Mathematics.
- To establish whether performance of pupils towards the learning of mathematics in Tangaza L G EA have positive impact.
- To determine whether there is any gender inequality in teaching and learning of mathematics in our schools.
- Find out the influence of these on the performance of pupils in Mathematics tests.

### **Research Questions**

1. What are the factors that contribute to the failures in mathematics between male and female in Tangaza LG EA of Sokoto state?
2. Does gender inequality have an effect on teaching and learning of mathematics?
3. Does the gender inequality affect the performance of pupils in learning mathematics?
4. What is the government perspective towards solving the problem of gender inequality in Mathematics?
5. What are the likely hindrances faced by the government and other stakeholders in solving the problems of gender inequality in Mathematics?

### **Significance of the Study**

The outcome of the study is hoped to reveal the kind of performance students attained on the learning of mathematics and the influence and motivation they have on the learning of Mathematics. Moreover the study shall reveal the challenges encountered especially the female students during the course of the learning processes and recommend solutions which shall be useful to both the students, teachers, parents and stakeholders in education.

### ***Scope and limitation of the Study***

This research will seek to know why the female gender are at the receiving end, the factor that brought about that, the root of the problem and the social cultural structure. The parental attitudes and religious beliefs that hinder the mathematics of the female gender as well as the general perception of men and the society at large. However this study is limited to some selected schools in Tangaza LGEA only, but the results are sufficient and can be adopted in areas not visited due to time constrain since the entire LGEA shared the same economic, religion and socio-cultural background..

### **Literature Review**

The problem which started off with cultural bias has not received any solution hence it has been a long age problem. Hadin (2001) opined that "till now, many parents and young female children still take Mathematics as an object of disorder to family life". Such people see the Mathematics and the female child as time and money wasting. It was supported by Osezuah (2001) when he stated that "they regard Mathematics as intruder and instrument of delay to marriage and child rearing". He continued by saying:

*though "this belief is held early by some Moslems of far north of Nigeria and some illiterate rural dwellers of the south". Interestingly, Dean David (1998) suggested that the exclusion of females in Mathematics began with the Greek mathematician Pythagoras, Margaret Wertheim, author of Pythagoras trousers, God, Physics and Gender Wars, recalls that the male mathematicians of Pythagoras' era associated masculine and feminine qualities with numbers: "odd numbers were considered male and good and even numbers were considered female and bad". Pythagoras formed a combination of scientific society and religious order known as the brotherhood. This established mathematics and science as priestly studies. This status was preserved when the Catholic Church of the middle ages began to establish the first world's universities.*

Haruna(2010)opined that "the mere fact of being born as a female often suggests how much and what type of mathematics the learner can get". AAJW (1989)asserted the expectation of parents in Mathematics is higher of boys than that of girls. This study is offer to show that there is no shortage of thoughtful explanations for why females are under-represented in all aspect of Mathematics.

### **Research Design**

The design for this study is a survey research design. Employing a questionnaire with ten (10) questions and a multiple choice options that consist of agree, disagree and undecided. Which is distributed to pupils in the target schools.

### **Population of the Study**

The population of this study consists of three (3) primary schools with five hundred and Ninety two (592) pupils in Tangaza local government of Sokoto state. The school include: Ninzamiyya model primary school Tangaza,AhmaduSarduana model primary school Tangazaand GidanSaruro Model Primary School Tangaza local government. These schools were upgraded to the junior secondary status, as such the studentsare within the age bracket of 11 to 15 years. The schools are strictly presented in the following table:

S/no	School	Females	Male	Total
1.	NinzamiyyaMoedl Primary School Tangaza	74	145	219
2.	AhmadSardauna Model Primary School Tangaza	140	113	253
3.	GidanSauro Model Primary School	47	73	120
	<b>Total</b>	<b>216</b>	<b>331</b>	<b>592</b>

### Sample and Sampling Techniques

Proportionate random sampling techniques only is used in selecting the sample of this study. The following tablet shows the sampled schools and their locations.

Schools	Total	20% of total
Ninzamiyya Model Primary School	219	54
AhamdSardauna primary school	253	66
Basic Model Primary School GidanSauro	120	30

### Instrumentation

Simple frequency and standard deviation is used to analyze the data collected from the questionnaires distributed to the pupils and their teachers.

### Method of Data analysis

The data collection are analyzed to answer the research question and the statistical tool used to analyses the collected data was simple percentage. That is the information collected was tabulated and measured with the use of simple percentage.

### Data analysis

#### Research questions 1

What are the factors that contribute to the failures in mathematics between male and female in Tangaza LGEA of Sokoto state?

**Table 1: factors that determine men's attitude**

Factor	A	%	SA	%	UD	%	DA	%	SDA	%	Total	%
Social economic background of parents affect the Mathematics of girl child	75	50	45	30	2	1.3	17	11.3	11	7.3	150	100
Child rearing also militate against the edition of the female child	70	46.7	50	33.3	-	-	20	13.3	10	6.7	150	100
Illiteracy of men affect their interest to send girls to schools	80	53.3	50	33.3	3	3	7	4.7	10	6.7	150	100
Health condition of the girls child affect her Mathematical opportunities	60	40	55	36.7	5	3.3	10	6.7	20	13.3	150	100

**Sources: field work**

From table one above, 75 out of 150 respondents agreed that social economic status of men is one of the major factors that hindered men to sponsor the Mathematics of the female gender while 45 respondents representing 30 percent strongly supported the above opinion that socioeconomic factors affect the attitude of men towards the Mathematics of the female gender. Two of the respondents were undecided whether socioeconomic status of men affects their attitude or not. The other 17 and 11 representing 11.3 and 7.3 respectively disagreed as well as strongly disagreed that economic status of men affects their attitude towards the Mathematics of the female gender.

Similarly, 70 (46.7%) out of 150 respondents ticked agreed and 50(33.3%) ticked strongly agreed that child rearing is another factor that militate against the Mathematics of the female gender, while the remaining 20 (13.3%) and 10 (6.7%) disagreed and strongly disagreed respectively rejected the opinion that child rearing affect the attitude of men towards the Mathematics of the opposite sex.

However, 80 (53.3%) and 50 (33.3%) out of 150 respondents respectively opted for agreed an strongly agreed that illiteracy affect men not to belief in the Mathematics of the female gender. While 3 (2%) respondents out of 150 were undecided. The remaining 7 (4.7%) and 10 (6.7%) respectively opted for disagreed and strongly disagreed with the opinion that illiteracy affect men attitude towards the Mathematics of the female gender.

Finally, 60 (40%) and 55 (36.7) out of 150 respondents respectively agreed and strongly agreed that the health condition of the girl child affects her Mathematicchance. While 5 (3.3%) out the 150 respondents were not certain whether or not the health condition of the girl child affects her Mathematicsopportunities. As concerning the remaining 10 (6.7%) and 20 (13.3%) respectively rejected the opinion.

**Research question 2**

Does gender inequality have an effect on teaching and learning of mathematics?

**Table 2: the interest of child in the Mathematics over the female gender**

Factor	A	%	SA	%	UD	%	DA	%	SDA	%	Total	%
Men are in favour of the Mathematics of the female gender	60	40	75	50	3	2	7	4.7	5	3.3	150	100
Men do not like the Mathematics of the female gender	30	20	10	6.7	5	3.3	50	33.3	55	36.7	150	100

**Source: field work**

From table two above, 60 (40%) and 75 (50%) tick agreed and strongly agreed to support the statement that men are in favour of the Mathematics of the female gender in the society. While 3 (2%) respondents were undecided and the remaining 7(4.7%) and 5 (3.3%) tick disagreed and strongly disagreed to reject the statement that men are in favour of the Mathematics of the female gender.

Again, 30 (20%) and 10 (6.7%) respondents out of 150 respondents agreed and strongly agreed that men do not like the Mathematics of the female gender. While 5 (3.3%) of the

respondents could not decide whether or not men like the Mathematics of the female child. Concerning the remaining 50 (33.3%) and 55 (36.7%) of the respondents marked disagreed and strongly disagreed to counter the statement that men do not like the Mathematics of the female gender.

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### Research question 3

Does the gender inequality affect the performance of pupils in learning mathematic?

Factor	A	%	SA	%	UD	%	DA	%	SDA	%	Total	%
The females are assets to their husband families	40	26.7	30	20	4	2.7	60	40	16	10.6	150	100
The girls child Mathematics ends in the kitchen	30	20	25	16.7	3	2	60	40	32	21.3	150	100
The female gender have nothing to offer them to keep the home and rear children	25	15.7	15	10	-	-	65	43.3	45	30	150	100
The culture of the land hindered the Mathematics of the female gender	45	30	40	26.7	2	1.3	43	28.7	20	13.3	150	100

#### Source: field work

The table three above indicates that 40 (26.7%) and 30 (20%) out of the 150 respondents agreed and strongly agreed to state that the female children are asset to their husband families. While 3 (2%) of the respondents could not decide and the remaining 60 (40%) and 16 (10.6%) of the respondents are of the view point that the female children are only assets to their husband family but to the larger society.

Similarly, 30 (20%) and 25 (16.7%) the respondents support the opinion that female child Mathematics ends in the kitchen by ticking agreed and strongly agreed. 3 (2%) out of the 150 respondents were undecided if the Mathematics of the female child ends in the kitchen or not. The remaining 60 (40%) and 32 (21.3%) of the respondents were in contrast with the opinion that the Mathematics of the female child ends in the kitchen.

Furthermore, 25 (16.7%) and 15 (10%) of the total respondents of 150 also agreed and strongly agreed to support the statement that the female child have nothing to offer than to keep the home and rear children. The remaining 65 (43.3%) and, 45 (30%) of the respondents rejected the statement by ticking disagreed and strongly disagreed.

Finally, 45 (30%) and 40 (26.7%) of the total respondents of 150 are of the opinion that the culture of the land hindered the Mathematics of the female gender and 2 (1.3%) out of 150 respondents were not sure whether the culture of the land hinder or support the Mathematics of the female gender. The rest 43 (28.7%) and 20 (13.3%) of the respondents say that the culture of the land does not hinder the Mathematics of the female gender by marking disagreed and strongly disagreed.

### RESEARCH QUESTION 4

What is the government perspective towards solving the problem of gender inequality in Mathematics?

**Table 4: government perception and actions to ameliorate gender inequality in mathematics**

<b>Government perception and action</b>	<b>A</b>	<b>%</b>	<b>SA</b>	<b>%</b>	<b>UD</b>	<b>%</b>	<b>DA</b>	<b>%</b>	<b>SDA</b>	<b>%</b>	<b>Total</b>	<b>%</b>
Government have seen Gender inequality in Mathematics as a problems	42	28	58	38.6	-	-	28	18.7	22	14.7	150	100
Government have plan some programmes and executed them to solve the problems of gender imbalance in Mathematics	49	32.7	62	41.3	4	2.7	30	20	5	3.3	150	100

**Source: field work**

From the table 4 above, 42 (20%) and 58 (38.6%) out of 150 respondents accepted the statement that government have seen gender inequality in Mathematics as problem while 28 (18.7%) and 22 (14.7%) countered the statement by ticking disagreed and strongly disagreed.

Again, 49 (32.7%) and 62 (41.3%) out of the 150 respondents accepted that government have planned and executed some programmes to ameliorate the problem of gender inequality in Mathematics. 4 of the respondents representing 2.7 percent were not sure if the government has taken any action or not. The rest 30 (20%) and had 5 (3.3%) of the respondents rejected the statement that government have taken any action to solve the problem of gender inequality in Mathematics.

**Research question 5**

What are the likely hindrances faced by the government and other stakeholders in solving the problems of gender inequality in Mathematics?

**Table 5: hindrances faced by the government in trying to solve the problems of gender inequality in Mathematics.**

<b>Hindrances</b>	<b>A</b>	<b>%</b>	<b>SA</b>	<b>%</b>	<b>UD</b>	<b>%</b>	<b>DA</b>	<b>%</b>	<b>SDA</b>	<b>%</b>	<b>Total</b>	<b>%</b>
Inadequate funding and manpower hindered gender equality in Mathematics	41	27.3	62	41.3	7	4.7	15	10	25	16.7	150	100
Inadequate skills and personnel to execute government programed	35	23.3	76	5.7	3	2	20	13.3	16	16.7	150	100

**Source: field work**

The first item in the above table indicates that 41 (27.3%) and 62 (41.3%) of the respondents ticked agreed and strongly agreed respectively to support the statement that inadequate funding and manpower contributed to problem of gender inequality in Mathematics while 7 of the respondents representing 4.7 percent were neutral to the opinion.' The remaining 15 (10%) and 25 (16.7%) of the respondents disbelieved the statement by indicating on disagreed and strongly disagreed.

Table 6: relationship of parental attitude to the problems of gender gap in Mathematics Furthermore, 35 (23.3%) and 76 (50.7%) of the respondents ticked it. agreed and strongly agreed to support the statement inadequate skill personnel Mathematics plan programmes and instability of government hindered Mathematics programmes that could cater for both sex in Nigeria. Yet 3 (2%) of the respondents were neutral by ticking undecided. The rest 20 (13.3%) and 16 (16.7%) of the respondents stated otherwise by ticking disagreed and strongly disagreed respectively.

**Discussion**

Based on the findings, the following conclusions were drawn:

That the parents are not in support of the mathematics of their daughters but rather supported the child even though they are limited by the economic status and social-cultural factors.

The government have also seen gender inequality in mathematics as problem and a threat to the economic wellbeing of the nation and as such stated making efforts to tackle the problem. More over government actions in the past to tackle the problem of gender inequality in mathematics were hindered by inadequate funding, manpower, skilled personnel and instability of government in Nigeria.

Parental attitude have significant relationship with the problem of gender inequality in mathematics. There is significant relationship between the perception of male and female with the perception and problem of gender inequality in mathematics but differ significantly between male and female, such that the male are dominating that of the female counterpart. More so, men's perception of the role of the female gender significantly influences their attitude towards their mathematics. Finally, there is no significant relationship with the perception of urban men and rural men towards the mathematics of the female gender since they differ in their perception of the female folk.

**Conclusions**

Gender inequality in the teaching/learning mathematics is a task that will still take some length of time displaying its ugly trend in Tangaza LGEA and Sokoto state in general, if measures are not taken. The measures to be taken should be met with conscious planning and actions, since some of the factors that have perpetuated the problem of gender inequality in mathematics before now are still living. The oral interviews conducted with the teachers and parents reveals that there is no single female child currently pursuing mathematics as a course in institutions of higher learning from this area, also there is less enrollment of females in all the science related subjects. This shows lack of total commitment from both the students as well as their parents whose sponsorship rest on their heads.

The researchers realized that female students constitute almost half of the populations in all the schools visited, this shows that there is awareness of enrollment of females into school even in the rural areas. What remains is to arouse their interest and give them the best of



mathematics teaching/learning so that they can also contribute their own quota towards solving the nation's current economic challenges.

### **Recommendations**

In view of the conclusions made, the following recommendations are proffered: there is the need to embark on a more serious and rigorous enlightenment drive to encourage the female gender to take active participation in various mathematical programs available to them or specially designed for them.

Secondly, Socio-cultural beliefs and religion should be put aside while the main goal should be to develop the individual to leave a self-fulfilled life as well as contribute his/her own quota to national development parents are to expect good results from the female child as they expected from their male counterpart. Finally the study have discovered that parents are still holding on their perceptions that the Mathematics of the female gender is a threat to the family and that it increase the chance of divorce and makes the female to abandon their family primary role and responsibilities. In view of this all stakeholders should put heads together in order to orientate the parents and reshaping their perception.

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