Effect of Parent-Child Communication Patterns on Junior Secondary School Students' Self-Esteem in Mathematics

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Abstract: **- The study determined the effect of parent-child communication patterns on Junior Secondary School students' achievement in mathematics. The study was guided by three (3) research questions and four (4) research hypotheses that were tested at 0.05 levels of significance. The design of the study is ex-post facto or causal comparative research design. The population of this study was four thousand eight hundred and sixty-seven (4867) Junior Secondary School 3 (JSS3) students in Enugu Education zone as at 2018/2019 academic session. The sample size of this study was three hundred and seventy (370) Junior Secondary School 3 (JSS3) students in four (4) sampled co-educational secondary schools in Enugu Education zone. The instrument used for data collection was Parental-Communication Pattern on Students' Achievement and Self-esteem (PCPSAS) questionnaire that was developed by the researchers. The instrument was validated by three (3) experts in the Department of Science Education, University of Nigeria, Nsukka. The reliability of the instrument was calculated as 0.83 using Chronbach Alpha. The data collected were analyzed using mean and standard deviation to answer the research questions while the hypotheses were tested using Analysis of Covariance at 0.05 level of significance. The study discovered that most parents adopted laissez-faire communication patterns as regards to their wards' learning of Mathematics which made their wards to have low self-esteem in mathematics. The study also, discovered that there was no significant difference between the mean self-esteem scores of students whose parents adopted the different parent-child communication patterns on the students' learning of Mathematics and there was also, no significant interaction between gender of students and their parent-child communication patterns on students' mathematics self-esteem scores. Hence, the study recommended that parents and mathematics should adopt pluralistic or consensual parent-child communication patterns on their wards as regards to their wards' learning of Mathematics in order to boost their self esteem in Mathematics.**

Keywords: **Parent-Child Communication, Self-Esteem, Patterns, Mathematics and Gender**

I. INTRODUCTION

The role of mathematics in the lives of individuals and in the society is very crucial. Mathematics is the gateway to achieving scientific and technological advancement and economic survival (Eguavon, 2012). Ukadike (1997) revealed that mathematics is indispensable because it has application in all other human activities including school science and technology based subjects. As such mathematics is one of the most important subjects Nigeria needs in this present era of technological advancement and in the realization of Nigerian vision of the year 2010 (Ukeje, 1997). Ugama (2011) stated that mathematics is the only language and culture that is common to all studies. It is the science of structure, order, and relation that has evolved from counting, measuring, and describing the shapes of objects (Nekang, 2018). For a person to be able to function very well within his immediate environment, the knowledge of rudimentary mathematics is very necessary.

It was as a result of application of mathematics in everyday life of an individual that prompted the Federal Government of Nigeria to make Mathematics a compulsory subject at primary and secondary school levels, though, not all the students are expected to become mathematicians (Oledele, 2004). The importance accorded mathematics in the school curriculum from the primary school to the secondary school level and even in the first two years of tertiary education reflects accurately the vital role played by the subject in contemporary society. Yet, it is a subject that is mostly failed in schools especially in secondary schools (Anibueze, 2017). Oledele (2004) stated that mathematics is the only subject that has the highest percent of massive poor students' achievement. The poor students' achievement in Mathematics has prompted the mathematics scholars to investigate on the causes. Most mathematics scholars like Ndukwe (2018), Anibueze (2017), Nwankwo (2012) have attributed the cause to teacher's methodology, other scholars like Eze (2006) has attributed it to government factor. But one factor that could affect students' achievement is students' self esteem. This is because according to Daniel (2011), self-esteem construct is recognized today to be a major factor that affects students' achievement (Daniel, 2011).

Self-esteem of the students has been linked with their academic achievement and these two are important factors for personnel development which the nation needs in order to meet with the global challenges in the competitive world (Offordile, 2012). Ahmed (2015) perceived self-esteem as the experience of being competent to cope with the basic

challenges of life and being worthy of happiness. Malbi and Reasoner (2000) defined self-esteem as the overall evaluation of oneself in either a positive or negative way. It indicates the extent to which an individual believes himself or herself to be competent and worthy of living. Self-esteem is an affective component of the self, consisting of a person's positive and negative self-evaluations (Offordile, 2012).Self-esteem of the students may/may not be affected parental communication pattern. According to Kelvin (2014), there was a positive relationship between student's self-esteem and parental involvement in students' academics.

According to Kernis, Brown and Brody (2000), the fathers/mothers of children with unstable self-esteem are more critical and psychologically-controlling, and less likely to acknowledge their positive behaviours or to show their approval in value-affirming ways whereas the fathers/mothers of children with low self-esteem reported that their fathers/mothers exhibited these qualities to a greater extent than did children with high self-esteem while the fathers/mothers of children with stable high self-esteem are good at problem solving. Whittaker (2010) revealed that when parents and youth have good communication pattern, along with appropriate firmness, youths will be less likely to report depression and anxiety and are more likely to be self-reliance and have high self-esteem.

According to Chuks (2015), the family is the first environment that a child meets when s/he is born, and the communication pattern that exists between the period of a child's birth and of his/her parents is very crucial in the child's self-esteem and academic achievement. The primary meaning of parent-child communication is that children learn communication with others, interpret others' feelings as well as generally experience the communication activities with others (Koerner, 2014). Principally, the parent-child communication concept is a scientific structure of the family's superficial world that is defined based on family members' communication with one another - what they tell one another, what they do and what they mean by these communications (Koemer and Fitzpatrick, 2012).

Chaffee, Mcleod, and Wackman (1973) declared that the family communication environment is characterized by the degree to which the parents emphasize two sets of norms: Socio-orientation and concept orientation. Socio-orientation stresses interpersonal harmony in the family and avoidance of conflicts or controversy. Concept orientation encourages children to think about and discuss political and social issues. According to Offordile (2012), a highly socio-orientated parent thinks that children should not argue with adults and should not express opinions different from other family members in order to maintain social harmony while a highly concept oriented parent believes that children should look at both sides of issues and talk freely about these issues. Whereas Richiel & Fitzpatrick (1990) stated that there are two types of parental communication pattern which are speaking and listening orientation pattern, and Unison orientation pattern. According to Richiel & Fitzpatrick (1990), since that concept-orientation emphasizes on the importance of beliefs, it must be named speaking and listening orientation in order to reflect the attention to discussion and open an accepting exchange of ideas between parents and children, and since that socio-orientation emphasizes on obedience, it must be named Unison orientation.

McLeod and Chaffee (1972) revealed that the two sets of norms can be further divided into a four-fold typology of parent-child communication patterns, which are; pluralistic-parents, protective parents, consensual parents and laissez-faire parents. According to Kelvin (2014), pluralistic-parents are high on concept-orientation but low on socio-orientation and they always emphasize that children should be given freedom of expression of ideas without fear of punishment. Pluralistic parents stresses a relationship between the child and issues (Ritchie and FitzPatric, 1990). While for protective-parents, Kelvin (2014) also stated that protective-parents are low on concept-orientation and high on socio-orientation, and they always have obedience and harmonious relationships with their children and show little concern over conceptual matters. In other words, Family communication in those families functions to maintain obedience and enforce family norms; little value is placed on the exchange of ideas or the development of communication skills. While for consensual parents, according to Kelvin (2014), consensual parents are high on both concept- and socio-orientations. Consensual parents always have relational harmony and free communication exchange with their children (Kelvin, 2014). In this type of family, children are allowed to express their ideas as long as the family's internal harmony is maintained (Offordile, 2012). In other words, communication in consensual families reflects a tension between exploring ideas through open communicative exchanges and a pressure to agree in support of the existing family hierarchy.

Kelvin (2014) revealed that laissez-faire parents are low on both concept- and socio-orientations. Laissez-faire parents encourage neither open communication between parents and children nor relational harmony. In this type of family, there may be very little conversation between parents and children (Offordile, 2012). In laissez-faire family, family members do not often engage each other in conversation and they place little value on communication or the maintenance of a family unit. Hence, this study shall make use of McLeod and Chaffee (1972)'s classification of family communication pattern in determining the effect of parent-child communication patterns on junior secondary school students' self-esteem in mathematics since that Chaffee and McLeod's family communication pattern has influenced family study for a long time in the 1970s and 1980s and is most widely used even in this present age (FitzPertrick, 2004; Chuks, 2015). Secondly, this family communication pattern is more elaborate than the other family communication patterns that are discussed above. Thus, there is need to investigate the effect of parents-communication pattern on students' mathematics self-esteem.

Hence, this study shall determine the effect of parents-communication pattern on Junior Secondary School students' mathematics self-esteem. This is because there is no mathematics scholar ever known to these researchers that has ever tried investigating the effect of parents-communication pattern on Junior Secondary School students' mathematics self-esteem.

Purpose of the Study

The main aim of the study was to determine the effect of parent-child communication patterns on junior secondary school students' self-esteem in mathematics. Specifically, the study determined the extent at which;

- A particular parent-child communication pattern is exhibited most by parents on the students' learning of Mathematics.
- Parent-child communication patterns affect the students' mathematics self-esteem.
- Parent-child communication patterns influence the male and female students' mathematics self-esteem.

The following research questions and Hypotheses guided the study:

RQ1 To what mean extent do parents' exhibit a particular parent-child communication pattern on the students' learning of Mathematics?

RQ2 What are the mathematics mean self-esteem scores of students whose parents adopted the different parent-child communication patterns on the students' learning of Mathematics?

RQ3 What are the mathematics mean self-esteem scores of male and female students whose parents adopted the different parent-child communication patterns on the students' learning of Mathematics?

$H0_1$: There is no significant difference between the mean responses of students on the parent-child communication pattern adopted by their parents.

$H0_2$: There is no significant difference between the mathematics mean self-esteem scores of students whose parents adopted the different parent-child communication patterns on the students' learning of Mathematics.

$H0_3$: There is no significant difference between mathematics mean self-esteem scores of male and female students whose parents adopted the different parent-child communication patterns on the students' learning of Mathematics.

$H0_4$: There is no significant interaction between gender of students and their parent-child communication patterns on students' mathematics self-esteem scores.

II. MATERIALS AND METHOD

The design of the study is ex-post facto or causal comparative research design. The ex-post facto research design seeks to establish relationship without any control or manipulation of the variables of interest. This design is fit for this study, since none of the variables under investigation will be controlled or manipulated. The area covered by this study is Enugu Education zone of Enugu State. The population of this study was four thousand eight hundred and sixty-seven (4867) Junior Secondary School 3 (JSS3) students in the thirty (30) secondary schools, which comprised of twenty-one (21) coeducational schools, seven (7) female schools and two (2) male schools in Enugu Education zone as at 2018/2019 academic session. The sample size of this study was three hundred and seventy (370) Junior Secondary School 3 (JSS3) students in four (4) sampled co-educational secondary schools in Enugu Education zone. Simple random sampling technique through balloting was used to sample the four co-educational secondary schools. In each of the co-educational schools sampled, simple random sampling technique through balloting was used to sample two intact classes. The aim of using co-educational secondary schools was because the study considered gender as a variable so as to have a basis for comparison. Hence, the study sampled one hundred and ninety-five (195) Junior Secondary School 3 (JSS3) male students and one hundred and seventy-five (175) Junior Secondary School 3 (JSS3) female students.

The instrument used for data collection was Parental-Communication Pattern on Students' Achievement and Self-esteem (PCPSAS) which was structured questionnaire that was developed by the researcher. The Parental-Communication Pattern on Students' Achievement and Self-esteem (PCPSAS) has two (2) sections; Section A is for personal information of the respondents while Section B is for eliciting responses from the respondents that is required for this study. Section B was designed in four (4) point rating scale. It has three (3) parts. Part 1 contained five (5) items each that designed the four types of parent communication pattern. The respondents were to tick accordingly to those items that described their parents. Part 2 contained ten (10) items that was used to determined respondents that have high-self esteem or low self-esteem. Any respondents whose mean is below 2.50 ($2.50 < \bar{x}$) for Part 2 was described to have low self esteem in mathematics while respondents whose mean is equal to or greater than 2.50 ($2.50 \leq \bar{x} < 3.00$) and less than 3.00 for Part 2 was described to have normal (average) self esteem in mathematics, whereas respondents whose mean is equal to or greater than 3.00 ($\bar{x} \geq 3.00$) for Part 2 was described to have high self esteem in mathematics. Part 3 contained only three boxes, the three boxes were used to enter the respondent's mathematics annual score for his/her JSS1, JSS2 and BECE mathematics scores.

The instrument was validated by three (3) experts in the Department of Science and Computer Education, Enugu State University of Science and Technology (ESUT). The

instrument was reliable trial tested at Army Day Secondary School, Garriki, Enugu state. This school is outside the area of the study as it is in Agbani education zone of the state. The data obtained from Part 1 and 3 of Section B of the instrument was analyzed using Cronbach Alpha. The reliability coefficient for Part 1 and 3 of Section B of the instrument was 0.83 and 0.84 respectively, which showed that the instrument was highly reliable. The research questions were answered using Mean score while the research hypotheses were tested using Analysis of Covariance. Analysis of Covariance was used because intact classes were used and as such corrects the error of initial difference in the ability levels among the students involved in the study. The null hypothesis (H_0) was rejected when the significance of F (value of the test statistics) was less than 0.05; otherwise it was not rejected at 0.05.

III. RESULT

Research Question One: To what mean extent do parents exhibit a particular parent-child communication pattern on the students' learning of Mathematics?

TABLE 1: THE MEAN EXTENT AT WHICH PARENTS EXHIBIT A PARTICULAR PARENT-CHILD COMMUNICATION PATTERN ON THE STUDENTS' LEARNING OF MATHEMATICS

Parent-child communication Pattern	Number	Mean ($\bar{x}$)	Standard Deviation (s)	Decision
Pluralistic parents	50	2.60	0.94	Averagely Used
Protective Parents	125	3.05	0.56	Mostly Used
Consensual parents	64	2.95	0.54	Averagely Used
Laissez-faire parents	131	3.06	0.55	Mostly Used
	370	**2.97**	**0.63**	

Table 1 above displayed the result of the Mean Extent at which Parents exhibit a particular Parent-Child Communication Pattern on the Students' Learning of Mathematics. Table 1 revealed that one hundred and thirty-one (131) students accepted that their parents adopted laissez-faire communication pattern as regards to their learning of Mathematics with the highest mean extent of 3.06 and standard deviation of 0.55; one hundred and twenty-five (125) students accepted that their parents adopted protective communication pattern as regards to their learning of Mathematics with a higher mean extent of 3.05 and standard deviation of 0.56; sixty-four (64) students accepted that their parents adopted consensual communication pattern as regards to their learning of Mathematics with a high mean of 2.95 and standard deviation of 0.54; and fifty (50) students accepted that their parents adopted pluralistic communication pattern as regards to their learning of Mathematics with the least mean of 2.60 and highest standard deviation of 0.94.

Research Question Two: What are the mathematics mean self-esteem scores of students whose parents adopted the different parent-child communication patterns on the students' learning of Mathematics?

TABLE 2: the MATHEMATICS MEAN SELF-ESTEEM SCORES of STUDENTS whose PARENTS ADOPTED the DIFFERENT PARENT-CHILD COMMUNICATION PATTERNS on the STUDENTS' LEARNING of MATHEMATICS

Parent-child communication Pattern	N	Mean ($\bar{x}$)	Standard Deviation (s)	Decision
Pluralistic parents	50	2.85	0.54	Average Self-esteem
Protective Parents	125	2.52	0.55	Average Self-esteem
Consensual parents	64	2.81	0.63	Average Self-esteem
Laissez-faire parents	131	2.31	0.53	Low Self-esteem
	370	**2.56**	**0.59**	Average Self-esteem

Table 2 above displayed the result of the mathematics mean self-esteem scores of students whose parents adopted the different parent-child communication patterns on the students' learning of mathematics. Table 3 revealed that the mathematics students in general have average self esteem. The study discovered that students whose parents adopted Pluralistic, Protective and Laissez-faire communication patterns as regards to their learning of Mathematics had an average self-esteem while students whose parents adopted Laissez-faire communication pattern as regards to their learning of Mathematics had a low self-esteem. The study discovered that among the students whose parents adopted Pluralistic, Protective and Consensual communication patterns as regards to their learning of Mathematics, students whose parents adopted Pluralistic communication pattern as regards to their learning of Mathematics had the highest self esteem with the mean score of 2.85, followed by students whose parents adopted Consensual communication pattern as regards to their learning of Mathematics with the mean score of 2.81 and standard deviation of 0.63, and finally, followed by students whose adopted Protective communication pattern as regards to their learning of Mathematics with the mean score of 2.52 and standard deviation of 0.63. The study also discovered that the mean score of the responses of the students who agreed that their parents adopted consensual communication pattern was not homogeneous because it had the highest standard deviation.

Research Question Three: What are the mathematics mean self-esteem scores of male and female students whose parents adopted the different parent-child communication patterns on the students' learning of Mathematics?

TABLE 3: the MATHEMATICS MEAN SELF-ESTEEM SCORES of MALE and FEMALE STUDENTS whose PARENTS ADOPTED the DIFFERENT PARENT-CHILD COMMUNICATION PATTERNS on the STUDENTS' LEARNING of MATHEMATICS

Parent-child communication Pattern	**MALE**				**FEMALE**			
	No	$\bar{x}$	***s***	**D**	**No**	$\bar{x}$	***s***	**D**
Pluralistic parents	26	2.84	0.54	ASE	24	qaqawsqwas	0.54	ASE
Protective Parents	63	2.50	0.46	ASE	62		0.63	ASE
Consensual parents	34	2.78	0.56	ASE	30		0.71	Low SE
Laissez-faire parents	72	2.37	0.55	Low SE	59		0.53	
	195	**2.55**	**0.55**	**Average SE**	**175**	**2.56**	**0.55**	**Average SE**

Table 3 above displayed the result of the mathematics mean self-esteem scores of male and female students whose parents adopted the different parent-child communication patterns on the students' learning of mathematics. Table 3 revealed that that the female students had a higher mean score of 2.56 and the same standard deviation of 0.55with that of their female counterparts whose mean score was 2.55 but however the difference is very negligible. The table also discovered that the differences between the mean scores of male and female students in different parent-child communication pattern were very negligible. The table discovered that all the male and female students whose parents adopted Pluralistic, Consensual and Protective communication patterns had average Self-Esteem while both the male and the female students whose parents adopted Laissez-faire communication pattern had low Self-Esteem.

The study discovered that male and female students whose parents adopted Pluralistic communication pattern as regards to their learning of Mathematics had the highest self esteem, followed by male and female students whose parents adopted Consensual communication pattern as regards to their learning of Mathematics and finally, followed by students whose adopted Protective communication pattern as regards to their learning of Mathematics. The study also discovered that the mean score of the responses of the female students who agreed that their parents adopted protective communication pattern was not homogeneous because it had the highest standard deviation while the mean score of the responses of the male students who agreed that their parents adopted protective communication pattern was more homogeneous because it had the least standard deviation.

Analyses of the Hypotheses:

The four (4) null hypotheses were tested at 0.05 levels of significance using ANCOVA.

Ho_1: There is no significant difference between the mean responses of students on the parent-child communication pattern adopted by their parents.

TABLE 4: ANALYSIS of COVARIANCE (ANCOVA) on the MEAN RESPONSES of STUDENTS on the PARENT-CHILD COMMUNICATION PATTERN ADOPTED by their PARENTS

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Decision
Corrected Model	8.455[a]	3	2.818	7.367	.001	
Intercept	2653.38	1	2653.3	6935.6	.000	
Parental Status	8.455	3	2.818	7.367	.001	S
Error	140.021	366	.383			
Total	3423.02	370				
Corrected Total	148.477	369				

a. R Squared = .057 (Adjusted R Squared = .049)

Table 4 presented the Analysis of Covariance (ANCOVA) on the mean Responses of Students on the Parent-Child Communication Pattern adopted by their Parents. From the result of ANCOVA in table 4, it was observed that Parental status (Parent-Child Communication Pattern) which was the main effect gave an f-value of 7.367 and was significant at 0.001. Since 0.001 was less than 0.05, this meant that at 0.05 level, the f-value was significant. Therefore, hypothesis 1 was rejected. Hence, the study concluded that there was significant difference between the mean responses of students on the parent-child communication pattern adopted by their parents.

TABLE 5: ANALYSIS of COVARIANCE (ANCOVA) of the MEAN SELF-ESTEEM SCORES of STUDENTS whose PARENTS ADOPTED the DIFFERENT PARENT-CHILD COMMUNICATION PATTERNS on the STUDENTS' LEARNING of MATHEMATICS

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Decision
Corrected Model	14.488[a]	7	2.070	6.668	.000	
Intercept	2157.0	1	2157.08	6949.2	.000	
Parental Status	14.411	3	4.804	15.475	.000	S
Gender Self-esteem	.022	1	.022	.070	.791	NS
Parental Status * Gender Self-esteem	.199	3	.066	.214	.887	NS
Error	112.36	362	.310			

a. R Squared = .114 (Adjusted R Squared = .097)

Table 5 above showed the Analysis of Covariance (ANCOVA) on the Mean Self-esteem scores of Students whose parents adopted the different parent-child communication patterns on the students' learning of Mathematics. The Table 5 shall be used to answer null hypotheses 2, 3 and 4.

Ho_2: There is no significant difference between the mathematics mean self-esteem scores of students whose parents adopted the different parent-child communication patterns on the students' learning of Mathematics.

From the result of ANCOVA in table 5, it was observed that Parental status (Parent-Child Communication Pattern) which was the main effect gave an f-value of 15.475and was significant at 0.000. Since 0.000 was less than 0.05, this meant that at 0.05 level of significance, the f-value was significant. Therefore, hypothesis 2 was rejected. Hence, the study concluded that there was significant difference between the mean self-esteem scores of students whose parents adopted the different parent-child communication patterns on the students' learning of Mathematics.

Ho_3: There is no significant difference between mathematics mean self-esteem scores of male and female students whose parents adopted the different parent-child communication patterns on the students' learning of Mathematics.

From the result of ANCOVA in table 5, it was observed that Gender Self-esteem (Male and Female) which was the main effect gave an f-value of 0.7and was not significant at 0.791. Since 0.791 was not less than 0.05, this meant that at 0.05 level, the f-value was not significant. Therefore, hypothesis 3 was rejected. Hence, the study concluded that there was no significant difference between the mean self-esteem scores of male and female students whose parents adopted the different parent-child communication patterns on the students' learning of Mathematics.

Ho_4: There is no significant interaction between gender of students and their parent-child communication patterns on students' mathematics self-esteem scores.

From the result of ANCOVA in table 5, it was observed that Gender (Male and Female) which was the main interaction effect gave an f-value of 0.214and was not significant at 0.887. Since 0.887 was not less than 0.05, this meant that at 0.05 level, the f-value was not significant. Therefore, hypothesis 4 was rejected. Hence, the study concluded that there was no significant interaction between gender of students and their parent-child communication patterns on students' mathematics self-esteem scores.

IV. SUMMARY OF FINDINGS

The study discovered the followings:

1. Most parents adopted laissez-faire and protective parent-child communication patterns on their wards as regard to wards' learning of mathematics while a greater number of parents adopted consensual parent-child communication patterns on their wards as regard to wards' learning of mathematics whereas very few parents adopted pluralistic parent-child communication patterns. These students' responses were significant.
2. Students generally had normal self esteem irrespective of the students' parents-child communication patterns except students whose parents-child communication patterns were Laissez-faire.
3. Students whose parents adopted Pluralistic and Consensual parents-child communication patterns as regards to their learning of Mathematics had the best and better mathematics self-esteem mean scores respectively than their counterparts whose parents adopted the other two communication patterns. The mathematics mean scores of students whose parents adopted the respective parent-child communication patterns were significant.
4. There was no significant difference between the mean self-esteem scores of students whose parents adopted the different parent-child communication patterns on the students' learning of Mathematics and there was also, no significant interaction between gender of students and their parent-child communication patterns on students' mathematics self-esteem scores.

V. CONCLUSION

The study determined the effect of parent-child communication patterns on Junior Secondary School students' self-esteem in mathematics. The study discovered that most parents adopted laissez-faire and protective parent-child communication patterns on their wards as regards to their wards' learning of Mathematics. From the study, it was discovered that students whose parents have laissez-faire communication patterns had low self-esteem in mathematics while students whose parents adopted Pluralistic and Consensual communication patterns as regards to their wards' learning of Mathematics had the highest mathematics self-esteem which were although average. But however, there is still need for parents to adopt pluralistic or consensual parent-child communication patterns as regards to their wards' learning of Mathematics. Secondly, the study discovered that there was no significant difference between the mean self-esteem scores of students whose parents adopted the different parent-child communication patterns on the students' learning of Mathematics and there was also, no significant interaction between gender of students and their parent-child communication patterns on students' mathematics self-esteem scores. This means that self-esteem of male and female students does not depend on gender but on parent-child communication patterns.

VI. RECOMMENDATIONS:

Considering the findings in this study, the following recommendations are made:

- Parents and mathematics should adopt pluralistic or consensual parent-child communication patterns on their wards as regards to their wards' learning of

Mathematics in order to boost their wards' self esteem in mathematics.

- Seminars and workshops on parent-child communication patterns should be organized by government and school authorities for parents and mathematics teachers through the Parent Teachers Association (PTA) forum.
- Mathematics teachers and parents should ensure that there is no gender discrimination in Mathematics lesson class or home.

COMPLIANCE WITH ETHICAL STANDARD

The researchers complied with research ethical standards

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DECLARATION OF INTEREST STATEMENT

The researchers do not have any conflict of interest.

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