

**PSYCHOLOGICAL FACTORS AND STUDENTS' ACADEMIC ACHIEVEMENT IN MATHEMATICS IN UGHELLI-SOUTH LOCAL GOVERNMENT AREA OF DELTA STATE, NIGERIA**

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**ABSTRACT:** *This study investigated psychological factors and students' academic achievement in mathematics. Five research questions and five hypotheses were used. The design for the study was correlational design. A sample size of 400 respondents was used. The study used simple random sampling to select the schools and stratified random sampling to draw the sample. The instruments used were Mathematics Achievement Test (MAT) and Psychological Factors Questionnaire (PFQ) for data collection. MAT and PFQ were validated by experts in Educational Psychology, Guidance and counseling based on face and content validity. The reliability of the instruments (MAT and PFQ) were also determined using test re-test method and the stability coefficients were 0.81 for self-concept on mathematics inventory, 0.75 for attitude towards mathematics inventory, 0.89 for mathematics motivation inventory and 0.70 for mathematics study habit inventory. Linear and multiple regressions were used to answer the research questions, while t-test and one way ANOVA associated with regression analysis were used to test the hypotheses. The findings of the study reveal that self-concept, study habit and motivation significantly relates to students' academic achievement in mathematics while attitude does not significantly relate to students' academic achievement in mathematics. It also reveals that Self-concept, study habit, attitude and motivation jointly significantly relate to students' academic achievement in mathematics. Some of the recommendations of the study are: Psychologists, counsellors, parents and teachers should encourage good study habits, positive self-concept and attitude in students and should also motivate students. The implications of the result and suggestions for further studies were made.*

**KEYWORDS:** Psychological Factor, Academic Achievement and Mathematics

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## **INTRODUCTION**

Mathematics is a branch of information that manages estimations, numbers and amounts. It is mandatory for conceding hopefuls into all order in tertiary foundations in Nigeria. For understudies to move ahead in their coveted scholarly vocation, they must pass the subject legitimately with no less than a credit.

Cohen (2000) stated that arithmetic is science dialect; it is the Pivot around which the entire embodiment of life rotates. Again mathematics is viewed as the basis for analysis thus, mathematical calculations is necessary. Mckee (2002) opined that every new body of discovery is mathematical in form because time and age must be calculated mathematically because it involves symbols and is essential for any meaningful involvement in modern civilization. As a result students, who must fit positively into society, are expected to know basic concepts and principles of mathematics by constantly practicing the rudimentary concepts involving figures,

especially in areas of factorization, like and unlike terms, simultaneous equation, quadratic equation and word problem in mathematics, as their usefulness is relevant in everyday dealings.

As a result, the subject must be grasped by rebuilding the self-idea, study propensity and accomplishment inspiration state of mind of young people towards how they perceive Mathematics.

According to Benson (2000) for transactions in buying and selling to succeed, ones abilities must be tuned to a point that he understands mathematical symbols and calculations. This he believes will eliminate cheating amongst the parties involved to large extent that is why learner's negative self-concept, attitude, achievement motivation and poor attitude towards mathematics should be restructured to reduce or eliminate the phobia associated with learning mathematical. It is because of how important mathematics is that it has been made compulsory and a pre-requisite subjects that science and arts students must pass at O level so as to gain admitted into the university. This is a strategy the Nigerian government use to make mathematics popular. To enhance mathematics learning among the students' in secondary schools is necessary as it brings about national progress and development would be adversely affected (Okoye, 2006).

As regards school subjects, the irrational belief that some school subjects are hard to comprehend begins to register in the students' subconscious, because of the societal beliefs. Probably, this could be the motivation behind why most understudies don't accomplish the fancied goal in mathematics. Gal (2000) emphasized that some contributing factors to students' lack of mathematics achievement are poor study habit and attitude towards the subject which is as a result of fear and the general impression created by the society, who believe that mathematics is difficult to comprehend.

According to Stone (2003) students do not learn automatically, they need guidance and direction before real interest is developed, eventually leading to effective learning. Some device ways sought by guidance counselors include; reconstructing study habit, self-concept, motivation and attitude to encourage the students, who have unconsciously developed a phobia and re-address their mind with positive statement such as, "I will understand mathematics, if I practice the concepts regularly".

According to Oyserman (2001) self-concept also relates to self-cognition, which means that individuals could interpret experiences such that it can affect their judgments and reactions towards academics. He stated that there are two types of self-concept which include academic self-concept which is the perception about personal academic abilities affecting particularly mathematics areas and the non-academic self-concept which includes the perception formed by individuals about his behaviour in the emotional, social and physical field. Again, Mckee (2002) opines that there is growing evidence in the students' negative attitude and belief about mathematics and that, through various teaching and learning styles, adopted by guidance counselors to aid students understanding, by making the students talk to themselves positively, the student's positive attitude and self-esteem becomes actualized.

According to Gargus (2002), when students encourage themselves with positive self-talk, on issues or areas that have been a burden to them, they tend to increase their level of determination to succeed, in that particular area of interest.

This helps the student to attain the aspired level to achieve success. Kochhar (2000) views study habit as important in assisting students with certain challenges in mathematics and also to help defective methods of hearing and poor motivation.

Achievement according to Dahir and Stone (2003) is gotten by the acquisition of skills and using these acquired skills to the best of the individual's abilities and capabilities to enhance his/her performance in life. Bandura (1997) stated that, people's personal expectations for achievement is important in enhancing their desire to succeed. For instance, if you believe that your effort at studying will result in good grade in your examination, you will be inspired to study. This belief helps to mobilize the individuals' energy in performing a lot better. This is why students, who constantly solve mathematics problems, with a mind-set to achieve success will excel.

According to Mangal (1998), when ones' achievement in a desired field is attained, life is fulfilling. The desire to achieve success he believes is as basic and natural as other biological needs, such as oxygen, which is essential for survival including psychosocial needs, which is needed for self-actualization. Also in Darling-Hammond (2002) view, peoples' aspiration to attain success helps people to succeed, particularly in their area of interest. However Davis (2001) believes that, the imbibed phobia for mathematics sometimes affects students' performance, to higher achievement levels, even if it's obvious that a good grasp of the subject would enable them gain admission into higher educational bodies. The term academic achievement has been described as the scholastic standing of a student at a given moment. It refers to how an individual is able to demonstrate his or her intellectual abilities (Opara & Nwaukwu, 2016). Based on this background, the present researcher was committed to investigate self-concept, study habit, attitude and motivation and its relationship to students' Academic achievement in mathematics.

Observation and report from examination bodies Uncovered that high rate of students in secondary schools perform poorly in mathematics examinations. Presently, poor performance in mathematics in Delta State has made many students drop out of school. Therefore, the required credit needed in the subject which is a compulsory prerequisite to gaining admission into any Nigerian tertiary institution is not achieved by the student. Failure in mathematics is could be caused by the concept one has about him or herself, habits in studying and motivation and attitude of students. Students' still generate great anxiety for the subject such that makes them run away from mathematics lessons. Students' negative attitude toward mathematics and their poor study habit makes them have little or no confidence in themselves. Poor performance trend in mathematics could affect student's achievement motivation and lead to students' creating an unconscious fear to the subject and this might invariably hamper students' accomplishment level in the pursuit of mathematics academic brilliance. As a result Of the obvious effect of this mathematics phobia in students, it becomes necessary to investigate why this trend consistently exists among students'. This study seeks to examine those degree/ extent to which self-concept, study habit, attitude and motivation relate to students' academic achievement in mathematics in Ughelli-South LGA of Delta State.

These research questions were formed as a guide to this study.

1. To what extent does self-concept relate to student's academic achievement in mathematics in Ughelli-South LGA of Delta State?
2. To what extent does study habit relate to student's academic achievement in mathematics in Ughelli-South LGA of Delta State?

3. To what extent does attitude relate to student's academic achievement in mathematics in Ughelli-South LGA of Delta State?
4. To what extent does motivation relate to student's academic achievement in mathematics in Ughelli-South LGA of Delta State?
5. To what extent does self – concept, study habit, attitude and motivation jointly relate to student's academic achievement in mathematics in Ughelli-South LGA of Delta State?

The following null hypotheses which was tested at 0.05 level of significance guided

1. Self-concept does not significantly relate to students' academic achievement in mathematics in Ughelli-South LGA of Delta State.
2. Study habit does not significantly relate to students' academic achievement in mathematics in Ughelli-South LGA of Delta State.
3. Attitude does not significantly relate to students' academic achievement in mathematics in Ughelli-South LGA of Delta State.
4. Motivation does not significantly relate to students' academic achievement in mathematics in Ughelli-South LGA of Delta State.
5. Self-concept, study habit, attitude and motivation do not have any significant combine relationship with students' academic achievement in mathematics in Ughelli-South LGA of Delta State.

## METHODOLOGY

In this study, Correlational design was used because it involves finding out if there is significant correlation between a dependent and independent variables. Correlational design is defined by Kpolovie (2010) as the type of study adopted for investigation of the magnitude and direction or nature of relationship that exist between a dependent variable (criterion variable) and one or more independent variables (predictor variables). According to Nworgu (1991) defined correlational design as the type of study that prove the relationship that exists between two or more variables. This design was used to find out if there is any relationship between self-concept, study habit, attitude and as well as motivation of students as they relate to academic achievement in mathematics.

The population of the study comprised of all senior secondary two (SSII) students in the twenty-four (24) secondary schools in Ughelli-South Local Government Area of Delta State managed by state education commission (S.E.C). Senior secondary two (SSII) students numbering 3,120 (three thousand one hundred and twenty) in 2014/2015 academic session formed the population for this study. (Source: State Educational Commission Headquarters Asaba, 2015).

A sample of 400 senior secondary two students [SSII] was used for the study. The researcher used simple random sampling technique via balloting to draw 6 secondary schools from 24 secondary schools in Ughelli-South L.G.A. Then stratified random sampling technique was used to draw 400 senior secondary two students [SSII] from the population of 3,120 senior secondary two students from Ughelli-south L.G.A.

This study made use of two instruments. They are "Psychological Factor Questionnaire" (PFQ) and "Mathematics Achievement Test" (MAT). The two instruments (PFQ and MAT) were developed by the researcher. The "Psychological Factors Questionnaire" (PFQ) consists of four

subsection which focus on self-concept, study habit, attitude and Motivation of students towards mathematics academic achievement. The questionnaire is made-up of four-point likert scale which require the students to indicate the level of agreement or disagreement with the items, thus, strongly agree (SA), Agree (A), Disagree (D) and strongly disagree (SD) was used. The independent variables are positively and negatively keyed with each subsection having 10 items making a total of forty (40) items.

The mathematics achievement test (MAT) contains fifty items comprising of simultaneous equation, quadratic equation, word problem in algebra, factorization and like/Unlike terms. These topics cover the present SSII first term syllabus of 2014 approved by the Federal Ministry of Education. The points awarded to (PFQ) items will be arranged in the descending order of magnitude with the exception of the negative statements which will be handled in reverse thus, positive items have 4,3,2,1 for strongly Agree (SA), Agree (A), Disagree (D), and strongly Disagree (SD). Based on this, the total score for each respondent on these variables: self-concept, study habit, attitude as well as motivation will be gotten by adding the scores of each respondent on each variable separately. Finally, the total score of the independent variable will be correlated with the total score of the dependent variable.

The instrument was constructed and given to three experts in the field of educational psychology for vetting and assessment of the suitability of the content of the questionnaire to ensure face validity and the instrument was finally modified by integrating into the work suggestions given by the experts. Their suggestions were that the questionnaire should reflect the variables under review. This procedure was followed so that their judgments were used to determine the validity of the instrument. This instrument was ascertained to possess content validity since items measured the variables under study.

Reliability of this instruments was determined through test-retest method. Simple random technique was used to draw a sample of 30 students for the reliability test. Copies of the instrument were administered to a similar group but not the same group for the study. After an interval of two weeks, the same instruments were administered to the same sample and their responses were scored. The initial and re-tested scores were correlated using Pearson Product Moment. The stability coefficient is 0.81 for self-concept on mathematics achievement inventory, 0.75 for attitude towards mathematics inventory, 0.89 for mathematics motivation inventory and lastly 0.70 for mathematics study habit inventory. The coefficient value so obtained is highly sufficient to guarantee the use of the instrument as a reliable one for the study. Copies of the questionnaires were administered to the respondent in their various schools by the researcher and were closely monitored for the completion and return of the instruments.

Linear and multiple regression was utilized to proffer solution to the research questions while t-test and one way Analysis of variance (ANOVA) associated with the regression analysis used to test the hypotheses at 0.05 alpha levels.

## RESULTS/FINDINGS

**Research Question 1:** To what extent does self-concept relate to students' academic achievement in mathematics in Ughelli-South LGA of Delta State?

**Hypothesis1:** Self-concept does not significantly relate to students' academic achievement in mathematics in Ughelli-South LGA of Delta State.



In order to answer the research question linear regression was used while in testing the null hypothesis, t-test associated with regression was employed.

**Table 4.: Linear regression analysis of the relationship between self-concept and students' academic achievement in mathematics.**

Model	R	R <sup>2</sup>	Adjusted R2	SE	N	
	0.115	0.013	0.011	15.96	400	
	<b>Coefficient</b>					
	<b>Unstandardized Coefficient</b>		<b>standardized coefficients</b>			
	B	Std Error	Beta	t	Sig	Result
(constant)	35.761	5.934		6.027	.000	Significan
Self-concept	-.481	.209	-.115	-2.304	.022	t(Reject Ho)

The result in table 4.1 showed linear regression analysis of the relationship between self-concept and student academic achievement in mathematics. The linear regression yielded a coefficient of 0.115 while R<sup>2</sup> is 0.013. This means that self-concept had a low relationship with student academic achievement in mathematics. Based on the R<sup>2</sup> value of 0.013, it indicates that the relationship of self-concept only explains 1.3% of the variation in student academic achievement in mathematics.

To determine if the relationship is significant or not, t-test associated with regression was employed. The beta value -0.115 is significant based on its t-value of -2.304 was significant at 0.022 level, which is lesser than the chosen probability level of 0.05. (B= -0.115, t = -2.304, p < 0.05). Hence the null hypothesis is rejected. This implies that self-concept significantly relates to students' academic achievement in mathematics in Ughelli-South LGA of Delta State.

**Research Question 2:** To what extent does study habit relate to students' academic achievement in mathematics in Ughelli-South LGA of Delta State?

**Hypothesis 2:** Study habit does not significantly relate to students' academic achievement in mathematics in Ughelli-South LGA of Delta State.

In order to answer the research question linear regression was used while in testing the null hypothesis, t-test associated with regression was employed.

**Table 4: Linear regression analysis of the relationship between study habit and students' academic achievements in mathematics.**

Model	R	R <sup>2</sup>	Adjustment R <sup>2</sup>	SE	N	
	0.216	0.047	0.044	15.69	400	
	<b>unstandardized coefficients</b>		<b>coefficient standardized coefficients</b>			
	B	Std. Error	Beta	t	Sig	Result
(constant)	47.531	5.787		8.213	0.000	Significant
Study habit	-.856	0.194	-0.216	-4.416	0.000	(Reject Ho)

The result in table 4.2 showed linear regression analysis of the relationship between study habit and students' academic achievement in mathematics. The linear regression yielded a coefficient of 0.216 while R<sup>2</sup> is 0.047. This means that study habit had a low relationship with students' academic achievement in mathematics. Based on the R<sup>2</sup> value of 0.047, it indicates that the relationship of study habit only explains 4.7% of the variations in students' academic achievement mathematics. To determine if the relationship is significant or not, t – test associated with regression was employed. The beta value of -0.216 is significant based on its t-value of -4.416 was significant at 0.000 level, which is lesser than the chosen probability level of 0.05. (B = -0.216, t= - 4.416, p<0.05). Hence, the null hypothesis is rejected. This implies that study habit significantly relate to students' academic achievement in mathematics.

### Research Question 3:

To what extent does attitude relate to students' academic achievement in mathematics in Ughelli-South LGA of Delta State?

**Hypothesis 3:** Attitude does not significantly related to students' academic achievement in mathematics in Ughelli-South LGA of Delta State.

In order to answer the research question linear regression was used while testing the null hypothesis t-test associate with regression was employed.

**Table 4.: Linear regression analysis of the relationship between attitude and students' academic achievement in mathematics.**

Model	R	R <sup>2</sup>	Adjustment R <sup>2</sup>	SE	N	
	0.038	0.001	-0.001	16.05	400	
	<b>coefficient</b>					
	<b>unstandardized coefficients</b>		<b>standardized coefficients</b>			
	B	Std. Error	Beta	t	Sig	Result
(constant)	26.757	6.045		4.426	0.000	Not Sig
Attitude	-.159	.209	-.038	-0.759	0.449	(Accepted Ho)

The result in table 4.3 showed linear regression analysis of the relationship between attitude and students' academic achievement in mathematics. The linear regression yielded a coefficient of 0.038 while R<sup>2</sup> is 0.001. This means with attitude had a low relationship with student's academic achievement in mathematics. Based on the R<sup>2</sup> value of 0.001 it indicate that the relationship of attitude only explain 0.1% of the variations in students' academic achievement in mathematics. To determine if the relationship is significant or not, t-test associated with regression was employed. The beta value of -0.038 is not significant based on its t-value of -0.759 that is not significant at 0.449 level, which is greater than the chosen probability level of 0.05 (B= -0.038, t= 0.759, p<0.05). Therefore the null hypothesis is accepted. This implies that attitude does not significantly relate with students' academic achievement in mathematics.

**Research Question 4:** To what extent does motivation relate to students' academic achievement in mathematics in Ughelli-South LGA of Delta State?

**Hypothesis 4:** Motivation does not significantly relate to students' academic achievement in mathematics in Ughelli-South LGA of Delta State.

In order to answer the research question linear regression was used while testing the null hypothesis t-test associated with regression was employed.



**Table 4: Linear regression analysis of the relationship between motivation and students' academic achievement in mathematics.**

Model	R	R <sup>2</sup>	Adjustment R <sup>2</sup>	SE	N	
	0.107	0.011	0.009	15.97	400	
	<b>coefficient</b>					
model	unstandardized coefficients		standardized coefficients			
	B	Std. Error	Beta	t	Sig	Result
(constant)	16.568	2.752		6.021	0.000	Significant
Motivatio n	0.196	0.091	0.107	2.143	0.033	(Reject Ho)

The result in table 4.4 showed linear regression analysis of the relationship between motivation and students' academic achievement in mathematics. The linear regression yielded 0.107 while R<sup>2</sup> is 0.011. This means that motivation had a low relationship with students' academic achievement in mathematics. Based on the R<sup>2</sup> value of 0.011. It indicate that the relationship of motivation only explain 1.1% of the variation in students mathematics academic achievement.

To determine if the relationship is significant or not, t-test associated with regression was employed. The beta value of 0.107 is significant based on its t-values of 2.143 was significant at 0.033 level, which is lesser than the chosen probability level of 0.005 (B=0.107, t=2.143, p<0.05). Hence the null hypothesis is rejected. This implies that motivation significantly relate to students' academic achievement in mathematics in Ughelli-South LGA of Delta State.

**Research Question 5:** To what extent does self-concept, study habit, attitude and motivation jointly relate to students' academic achievement in mathematics in Ughelli-South LGA of Delta State?

**Hypothesis 5:** Self-concept, study habit, attitude and motivation do not have any significant combine relationship with students' academic achievement in mathematics in Ughelli-South LGA of Delta State.

**Table 4.5 multiple regression analysis of the joint relationship between self-concept study habit, attitude and motivation and students' academic achievement in mathematics.**

<b>Model</b>	<b>R</b>	<b>R<sup>2</sup></b>	<b>Adjustment R<sup>2</sup></b>	<b>SE</b>	<b>N</b>
	0.277	0.077	0.067	15.50	400
<b>Analysis of variance (ANOVA)</b>					
	<b>Sum of squares</b>	<b>df</b>	<b>Mean square</b>	<b>F-cal</b>	<b>P</b>
<b>Regression</b>	7865.248	4	1966.312	8.182	0.000
<b>Residual</b>	94921.690	395	240.305		
<b>Total</b>	102786.935	399			

**Depend variable:** students' academic achievement in mathematic

**Predictor variable:** self-concept, study habit, attitude and motivation.

The result in table 4.5 showed multiple regression analysis of the joint relationship between self-concept, study habit, attitude and motivation and students' academic achievement in mathematics. The multiple regression coefficient obtained is 0.277 while the  $R^2$  is 0.077 it indicates that the joint relationship of the four independent variables will only explain 7.7% of the variation in students' academic achievement in mathematics. To determine if the relationship is significant or not, analysis of variance (ANOVA) associated with multiple regression was employed. The calculated F-value of 8.182 which is significant at 0.000 levels is lesser than the chosen level probability of 0.05  $F(4, 395) = 8.182$  and  $p < 0.05$ . Hence, the null hypothesis is rejected. This implies that self-concept, study habit, attitude and motivation jointly significantly relate to students' academic achievement in mathematics.

## DISCUSSION OF RESULTS

### Relationship between Self-Concept and Students' Academic Achievement in Mathematics.

The result of the research question shows that self-concept has a relationship with students' academic achievement in mathematics. The linear regression yielded a coefficient of 0.115 while  $R^2$  is 0.013 (Table 4.1). The hypothesis stated that the beta value of -0.115 is significant based on its t-value of -2.304 which was significant at 0.022 level, which is lesser than the chosen probability level of 0.05. Hence the null hypothesis is rejected. This implies that self-concept significantly relate to students' academic achievement in mathematics. The findings of this study, is in agreement with those of Morita (2005) and Constantine (2009). Morita (2005) conducted a longitudinal study of self-concept in eight and tenth grade students and after correlation of the first and second test after two years discovered that the students who

have negative self-concept show poor performance than the students with positive self-concept. Constantine (2009) reported that self-concept is related to academic performance because in his study, students with positive self-concept were found to perform better in their academics. The present finding disagree with the findings of Stefano (2003) who asserted that self-concept does not have significant relationship with academic achievement.

### **Relationship between Study Habit and Students' Academic Achievement in Mathematics.**

The result of the research question shows study habit had a relationship with students' academic achievement in mathematics. The linear regression yielded a coefficient of 0.216 while  $R^2$  is 0.047 (Table 4.2). The hypothesis stated that the beta value of 0.216 is significant based on its t-value of -4.416 which was significant at 0.000 level, which is lesser than the chosen probability level of 0.05. Therefore, the null hypothesis is rejected. This implies that study habit significantly relate with students' academic achievement in mathematics. The finding of this study is in agreement with the findings of Aluede and Onolenhemhen (2001) and Sirohi (2004) who asserted that good study habit bring about improvement in students' academic achievement. Sirohi found that study habit guidance program lead to better academic performance. The present finding disagree with the finding of Harrison (2013) who conducted a study on learning styles and study habit using 159 students. The result shows that there is no significant relationship between study habit and students' academic achievement.

### **Relationship between Attitude and Students' Academic Achievement in Mathematics.**

The result of the research question indicates that attitude had a low relationship with students' academic achievement in mathematics. The linear regression yielded a coefficient of 0.038 while  $R^2$  is 0.001 (Table 4.3). The hypothesis stated that the beta value of -0.038 is not significant based on its t-value of -0.759 that is not significant at 0.449 level, which is greater than the chosen probability of 0.05. Therefore the null hypothesis is accepted. This implies that attitude do not significantly relate with students' academic achievement in mathematics. The findings of this study disagree with those of Mensah, Okyere and Kuranchi (2013), in their study of students' attitude towards mathematics and performance showed a significant relationship between students' attitude and students' level of academic achievement. Mamman and Penisi (2005) embarked on a research on class practice to improve students' attitude towards mathematics using 108 high school students. The result found a better performance from students' outside the class practice.

### **Relationship between Motivation and Students' Academic Achievement in Mathematics.**

The result of the research question shows that motivation had a relationship with students' academic achievement in mathematics. The linear regression yielded a coefficient of 0.107 where  $R^2$  is 0.011 (Table 4.4). The hypothesis stated that the beta value of 0.107 is significant based on its t-value 2.143 which was significant at 0.033 level, which is lesser than the chosen probability level of 0.05. Hence, the null hypothesis is rejected. Thus, implies that motivation significantly relate to students' academic achievement in mathematics. The findings of this study is in agreement with Akinlana (2013) and Beth (2005), Akinlana conducted a study on academic optimism, academic motivation and mental ability using 600 respondents. The findings indicate that academic optimism, academic motivation and mental ability significantly predict students' mathematics academic performance. Beth (2005) reported that students who are motivated to study and perform better when the subject is interesting and practical.

### **Combine Relationship Between Self-Concept, Study Habit, Attitude Motivation And Students' Academic Achievement In Mathematics.**

The result of the research question indicates that self-concept, study habit, attitude and motivation jointly relate to students' academic achievement in mathematics. The multiple regression coefficient obtained is 0.277 while the  $R^2$  is 0.077 (Table 4.5). The hypothesis stated that the calculated F-value of 8.182 which is significant at 0.000 levels is lesser than the chosen level of probability of 0.05. Hence, the null hypothesis is rejected. This implies that self-concept, study habit, attitude and motivation jointly significantly relate to students' academic achievement in mathematics. The findings of this study is in agreement with Obodo (1997) who asserted that positive self-concept and attitude are related to students' academic performance

### **CONCLUSION**

The results of the study were summarized as follows:

1. Self-concept significantly relate to students' academic achievement in Mathematics in Ughelli-South LGA of Delta State.
2. Study habit significantly relate to students' academic achievement in mathematics in Ughelli-South LGA of Delta State.
3. Attitude does not significantly relate to students' academic achievement in mathematics.
4. Motivation significantly relate to students' academic achievement in mathematics in Ughelli-South LGA of Delta State.
5. Self-concept, study habit, attitude and motivation have significant combine relationship with students' academic achievement in mathematics in Ughelli-South LGA of Delta State.

### **Implications**

- The findings of this study indicate that self-concept is related to students' academic achievement in mathematics. This implies that students should be encouraged to develop a positive self-concept towards mathematics so as to boost their academic achievement in mathematics.
- The study shows that mathematics academic achievement of students is related to study habit. This implies that good study habit could improve students' performance. Thus, study habit guidance program should be given to students in order to improve their academic achievement in mathematics.
- Students should also endeavour to develop the right attitude towards mathematics which is a positive attitude.

- Both parents and teachers should be aware that motivation is related to students' academic achievement in mathematics, thus, they should strive to always motivate the students however they can so as to bring about better performance in mathematics.
- The school should ensure that students are aware of the fact that self-concept, study habit, attitude and motivation jointly relate to their academic performance in mathematics. This can be done by organising public lectures, workshops or seminars to enlighten them.
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## RECOMMENDATIONS.

Based on the findings and implications of this research, the researcher is obliged to make the following recommendations.

- School guidance counsellors should encourage students to develop a positive self-concept and attitude towards mathematics. If this is done, students will appreciate mathematics and tension will decrease thereby encouraging them to do better in their mathematics.
- Parents and teachers should lay emphasis on good study habit and organise study habit guidance programme in order to guide the students on how to develop a good study habit that will in turn reflex in their academics, thereby making them perform better.
- Ministry of Education should motivate students by giving scholarship to students who perform well in their academics and in mathematics. This will encourage other students to work hard and strive to get better in their academic pursuit.
- Schools and school administrators should also give awards to students who perform well both in mathematics and in other subjects as well, so as to motivate them. Parents and teachers can also serve as motivators encouraging students in their mathematics academic achievement.
- The school, teachers and parents should pay more attention to mathematics since it is compulsory and a prerequisite in gaining admission into the tertiary institutions

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