

Correlation between students' attitude towards mathematics and students' achievement in mathematics

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Abstract: Attitude is an integral factor in determining the success of students in mathematics. This work is a quantitative study which explores the correlation between students' attitude towards mathematics and students' achievement in mathematics in Federal College of Freshwater Fisheries Technology, New Bussa, Niger State, Nigeria. It compares the attitude and achievement of male and female students in mathematics and also compares their attitude and achievement by level. Sample of the study was 121 students (male = 91 and female = 30) drawn from Pre-ND, ND and HND in FCFFT, New Bussa. Questionnaire method was used to gather data on the attitudes of the students and secondary data was collected on the achievement of the students in mathematics. SPSS 17.0 statistical program was used to analyze the data in this study. The results of this study indicated that students' attitude towards mathematics and students' achievement in mathematics are moderately correlated and there is no significant difference between male and female students' attitude towards mathematics but female student slightly have a better performance in mathematics than the male students in FCFFT, New Bussa. Also HND students have a more positive attitude and achievement in mathematics than Pre-ND and ND students. It was then concluded that improvement in the attitude of the students will bring improvement in their performance in mathematics.

Key words: Achievement, Attitude, Correlation, Mathematics, and Student.

I. Introduction

Every individual require the knowledge of mathematics to function effectively and efficiently in today's world irrespective of his/her job or profession^[1]. It is a tool that can be used in our daily life to overcome the difficulties faced^[2]. Mathematics disciplines the mind, systematizes one's thought and reasoning^[3].

Attitude towards mathematics plays a crucial role in the teaching and learning processes of mathematics. It affects students' achievement in mathematics^[4].

Students' success in mathematics depends upon attitude towards mathematics^[4]. It is generally believed that students' attitude towards a subject determines their success in that subject^[5]. Positive attitudes are conducive to good performance^[6]. A number of researchers have demonstrated that there is a significant correlation between attitude and achievement^{[3][7][8]}. If students' attitude towards a subject is improved, the performance in the subject will improve^[8].

Various researchers concluded that students' positive attitude towards mathematics leads towards success in mathematics^{[4][9]}.

Not many school children have interest in the subject even right from the primary school level^{[1][10]}. However, some studies show that students have a relatively positive attitude towards mathematics^{[11][12]}.

Also there are many studies that suggest that there is no significant difference between attitude towards mathematics among male and female students^{[13][14]}. It is generally held that females exhibit less positive attitudes towards mathematics than males do^[3].

A research was conducted in Federal College of Freshwater Fisheries Technology, New-Bussa on students' attitude towards mathematics and found that students' attitude towards mathematics is poor^[10]. And it was recommended that a research be carry out to find the correlation between students' attitude towards mathematics and students' achievement in mathematics^[10].

This study therefore tries to investigate the correlation between students' attitude towards mathematics and students' achievement in mathematics in Federal College of Freshwater Fisheries Technology, New Bussa, Niger State, Nigeria.

The specific objective would therefore be;

- To find out the correlation between students' attitude towards mathematics and students' achievement in mathematics.
- To examine the attitude score between male and female students in mathematics.
- To examine the achievement score between male and female students in mathematics.
- To find out the correlation between "Pre-ND", "ND" and "HND" student' attitude towards mathematics.

- To compare the achievement score of Pre-ND, ND and HND students in mathematics.

Hypotheses

In keeping with objective of the study, the following research hypotheses are formulated;

H₀₁: There is no significant difference between students' attitude towards mathematics and students' achievement in mathematics.

H₀₂: There is no significant difference between male and female attitude in mathematics.

H₀₃: There is no significant difference between male and female students' achievement in mathematics.

H₀₄: There is no significant difference between Pre-ND, ND and HND students' attitude towards mathematics.

H₀₅: There is no significant difference between Pre-ND, ND and HND students' achievement in mathematics.

II. Methodology

The following methods and procedures were adopted in conducting this study.

Population and Sample

Students of both genders constitute the population of this study. The number of students that participated in this study is 121, of which 91(75%) are male students and 30(25%) are female students. The sample comprises of all students of Pre-ND, ND1 (Food Science Technology and Fisheries Technology departments) and HND1 (Agric Extension & Management Department).

Procedures for Data Collection and Analysis

The questionnaire instrument was administered to all the students of Pre-ND, ND1 (Food Science Technology and Fisheries Technology departments) and HND1 (Agric Extension & Management Department) individually by the researchers. The choice of these classes is based on the fact that they are the classes that offer pure mathematics in FCFPT, New Bussa. The questionnaire for students comprised of 16 items based on a 4-point likert scale measuring their attitude towards Mathematics. The response were rated as; Strongly Disagree = 1, Disagree = 2, Agree = 3 and Strongly Agree = 4. The result of students in mathematics for 2014/2015 academic session was collected from FCFPT examiners.

The findings of the study were analyzed using SPSS 17.0 statistical program. In the study, the statistical measures; means, standard deviation, t-test and Pearson's correlation were calculated.

III. Results and Discussions

The respondents of this study are between the ages of 17 and 44.

Table 1: Students' achievement scores

L e v e l	S c o r e s	F r e q u e n c y
S o L o w	1 - 2 5	7
Low	26 - 50	54
Medium	51 - 75	40
High	76 - 100	10

Source: Exams Records FCFPT, New Bussa

Table 2: Analysis of correlation between students' attitude and achievement in mathematics

V a r i a b l e	N	v - v a l u e	p - v a l u e	D e c i s i o n
A t t i t u d e S c o r e				
VS	121	0.408	0.01***	Significant
A c h i e v e m e n t S c o r e				

***Correlation is significant at the 0.01 level (2-tailed)

Table 3 : T-test analysis of male and female students' attitude towards mathematics

G e n d e r	N	M e a n	S t d . D e v i a t i o n	t	S i g . (2 - t a i l e d)
A t t i t u d e S c o r e					
M a l e	9	35.5495	11.26180	.255	.799 NS
F e m a l e	30	34.9333	12.08000	.246	.807

NS: t-value not significant

Table 4: T-test analysis of male and female students' achievement in mathematics

G e n d e r	N	M e a n	S t d . D e v i a t i o n	t	S i g . (2 - t a i l e d)
A c h i e v e m e n t S c o r e					
M a l e	9	45.0769	18.77009	-2.186	.031**
F e m a l e	30	54.0000	21.18392		

** t-value significant at 5%

Table 5: T-test analysis comparing of Pre-ND and ND 1 students' attitude towards mathematics

	L e v e l	N	M e a n	Std. Deviation	t	Sig.(2-tailed)
Attitude Score	Pre - ND	13	34.4615	13.32676	-.135	.893 NS
	ND 1	98	34.9286	11.46150		

NS: t-value not significant

Table 6: T-test analysis comparing attitudes of ND 1 and HND 1 students' towards mathematics

	L e v e l	N	M e a n	Std. Deviation	t	Sig.(2-tailed)
Attitude Score	ND 1	98	34.9286	11.46150	-1.696	.093 **
	HND 1	10	41.2000	6.76264		

** t-value significant at 10%

Table 7: T-test analysis comparing achievement of Pre-ND and ND 1 students' towards mathematics

	L e v e l	N	M e a n	Std. Deviation	t	Sig.(2-tailed)
Achievement Score	Pre - ND	13	43.3846	1.68555	-.231	.817 **
	ND 1	98	44.6122	18.51477	-.308	.761**

** t-value not significant

Table 8: T-test analysis comparing achievement of ND 1 and HND 1 students' towards mathematics

	L e v e l	N	M e a n	Std. Deviation	t	Sig.(2-tailed)
Achievement Score	ND 1	98	44.6122	18.51477	-5.726	.000 **
	HND 1	10	78.600	8.38252	-10.477	.000**

** t-value significant at 10%

Five important findings emerged from this study. First, in table 2, the result reveals significant correlation between students' attitude towards mathematics and achievement in mathematics at 0.01 level of significance. Therefore, the null hypothesis H_{01} is accepted. This finding is similar to the findings of Mahanta et al (2012), Papanastious (2002), and Aremu (1997) that there is a significant correlation between attitude and achievement.

Secondly, in table 3, there is no significant difference between male and female students' attitude towards mathematics. Therefore the null hypothesis H_{02} is accepted. This agreed with the findings of Köğçe, et al, (2009) and Mohd, et al (2011) that there is no significant difference between attitude towards mathematics among male and female students, and contradicts the finding of Mahanta et al (2012) that females exhibit less positive attitudes towards mathematics than males do.

Thirdly, in table 4, there is a significant difference between male and female students' performance in mathematics at 5% therefore the null hypothesis H_{03} is rejected.

Fourthly, in table 5, there is no significant difference between Pre-ND and ND students' attitude towards mathematics. And in table 6, there is a significant difference between ND and HND students' attitude towards mathematics. Therefore null hypothesis H_{04} is rejected.

And Fifthly, in table 7 shows that there is a significant difference between Pre-ND student performance in mathematics and ND1 students. And table 8 also shows that, there is a significant difference between ND1 student performance in mathematics and HND1 students. This may be because the HND1 students might have been exposed to mathematics twice (both at ND and HND level). Therefore, the null hypothesis H_{05} of non significant is rejected.

IV. Conclusion and Recommendations

This study shows that attitude of students' and achievements of students' in mathematics are positively correlated. There is no significant difference between male and female students' attitude towards mathematics but female students in Federal College of Freshwater Fisheries Technology, New Bussa have a slightly better achievement in mathematics than their male counterpart. Also attitude and achievement of HND students in mathematics is more positive than that of Pre-ND and ND students. This could be attributed to the fact that HND students have been exposed to more mathematics courses than the Pre-ND and ND students in Federal College of Freshwater Fisheries Technology, New Bussa.

Therefore, improvement in the attitude of the students will bring improvement in their performance in mathematics. And the students should be engage in more practical mathematical activities.

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Appendix

Sample statements of students' attitude towards mathematics

S/No	Q	u	e	s	t	i	o	n	Strongly Agree	Agree	Disagree	Strongly disagree
1	Mathematics is enjoyable to me.	4							3	2	1	
2	Mathematics is exciting.	4							3	2	1	
3	Mathematics subject is easy to learn.	4							3	2	1	
4	Studying mathematics makes me feel happy.	4							3	2	1	
5	Mathematics is important in everyday life.	4							3	2	1	
6	The skills I learn in mathematics class will help me in other classes for my major.	4							3	2	1	
7	I like mathematics.	4							3	2	1	
8	Mathematics makes me feel important.	4							3	2	1	
9	Mathematics is important for my chosen profession.	4							3	2	1	
10	It takes me less time to understand any idea in mathematics.	4							3	2	1	
11	I am happier in a mathematics class than in any other class.	4							3	2	1	
12	Mathematics is a straightforward subject.	4							3	2	1	
13	Studying mathematics strengthens my thinking ability and gives me pleasure.	4							3	2	1	
14	Mathematics is not difficult.	4							3	2	1	
15	Mathematics is stimulating to me.	4							3	2	1	
16	Mathematics is my best subject.	4							3	2	1	