Students' Variables and their Academic Achievement in Technical Colleges in Mathematics, Ogoja Education Zone, Cross River State

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Abstract
The study examined the influence of students' variables on theiracademic achievement in technical colleges in Mathematics in Ogoja Education zone, Cross River State. Three null hypotheses were generated to aid this work. The study employed a survey research design. Simple random sampling technique was used to select a sample of two hundred (200) SS3 students' from a population of one thousand seven hundred and twenty students (1720) from ten (10) technical colleges within Ogoja Education zone. The instrument used for data collection were a valid twenty (20) items structured four point rating scale questionnaire on students' variables with a reliability coefficient of 0.78, established through Cronbach Alpha and a twenty items self-made Mathematics Achievement Test for technical colleges students. Using independents t-test analysis, data collected was analyzed with the hypotheses tested at 0.05 level of significance. The result of the study showed that positive attitude, students with interest, and high self-concept, significantly influence students' academic achievement in the subject. It was concluded that students' variables have significant influence on their academic achievement in Mathematics. On this note, it was recommended among others that parents and teachers should encourage their children to become interested in Mathematics by properly orienting them on the need to study as to perform well.
Keywords: Students' Variables, Attitude, Interest, Self-concept.

Introduction
Development of any nation is largely determined by its level of advancement and innovation in Mathematics, Science and Technology (STM). Mathematics is defined as an organized and applied scientific language necessary for the understanding of science and technology. This follows from the fact that Mathematics enhances the study of science which is the springboard for technological and overall national development (Azuka 2000). Adie (2013) posit that Mathematics is a systematic science with a conscious or an unconscious

originality,practicability and applicability in the daily activities of human. True to this, is that, all other human activities revolve around it.

Mathematics which is the subject interest of this study is required by everyone in every area of the society (Akinsola, Tella& Tella, 2007). Moreover, Bande (2004) and Elegbede (2004) separately demonstrated this when they pointed out clearly that there was no science without Mathematics. The Subject is however acknowledged by many as the Mother of all subjects and Learning, since other subjects (both science and arts are believed to derive their concept from it). More so, the compulsory nature of the subject in school, carries with it the assumption that all members of the society should be well vest in the subject if they are to function well in the society.

However, despite this elevated and all important nature of Mathematics in our educational system and society, it is sad to see that over the years, students' in secondary schools in Nigeria have been consistently performing poorly in the subject (Ajagun 2000). This unacceptable rate of students' low achievement has become worrisome to teachers, school administrators, parents, the government, the society and the nation at large (Ajagun 2000).

Consequently, some variables such as teachers' variables school, home and students' variables have been attributed to students' low achievement in Mathematics, but this paper is solely concerned with exploring the influence of students' variables on students' academic achievement. Academic achievement refers to excellence in the formative or summative text and examination outcome of student in different subject over a given period of time in all academic disciplines.

Students' variable may be defined as those factors associated with students of all educational levels that either promote or hinder their academic performance at school. Some of these factors include Motivation, Interest, Attitude, Anxiety, Self-concept and Study Skills. This study will explore three of the students' variables mentioned above attitude, interest and self-concept.

Attitude is a settled way of thinking or feeling about something. This could be described as an individuals' predisposed way of life precipitated upon by an action. Most students perform badly in Mathematics because they already develop a phobia for it. Some students see mathematics as an abstract subject and others, assume that it make people behave crazy, thereby creating a negative attitude on their interest.

However, Owodeji and Harbor-Peters (2000) is of the opinion that students' achievement in Mathematics can be better, if only the right attitude is developed and maintained towards the subject. This view is in line with Akinyemi (2009) who believed that improved students' attitude in science subject and Mathematics in particular will enhance students' achievement in the subject.

Interest which is one of the aforementioned sub-variable could be defined as a feeling of wanting to know or learn about something. It is a true saying that people work hard and dedicatedly, at task they are fully interested in, this implies that for students to perform or achieve maximally in Mathematics then interest must be generated and sustained. In line with this, Akinsola and Popoola (2004), Eddoho and Uwase (2018) and Adie (2013) in their various studies have all indicated that positive interest in Mathematics leads to better achievement.

Another identifiable factor is self-concept. This is the personal perception, awareness, and insight a person holds about himself or herself (Oluwo, 1990). In other words, it is a construct which is inferred from behavior and which evolves from experience. Self-concept is important in the development of an individual's behavior. Hence, self-concept influences how a person thinks, feels, learns, understands and relates with other people, and more importantly the value one ascribe to oneself. Peralta (2004) conducted a study on the relationship between self-concept and academic achievement among primary school pupils which revealed that self-concept in Mathematics and in reading have very high degree of association to the two measures of achievement. Suleiman and Elizabeth (2012) in their study to determine the relationship between self-concept, gender and academic achievements of science students in Katsina State, found out that there is a significant relationship between self-concept and academic achievements of science students.

Statement of the Problem

Over the years, it has been observed that students' in secondary schools in Nigeria and Cross River North in particular have consistently performed poorly in Mathematics in both internal and external examinations. Despite all relentless efforts by the government, school administrators, teachers, parents and other education stakeholders to improve students' performance in Mathematics, their academic performance in the subject is still deteriorating at a lamentable rate.

Some notable causes perceived by previous researches to be responsible for students' poor performance in Mathematics are teachers' factors (poor teaching methods, poor knowledge of the subject area, poor preparation, none utilization of instructional materials) and school factors such as unconducive learning environment, lack of instructional materials, poor supervision, lack of incentive for teachers, poor salaries and poor management. Only few of these studies have explored the students' variables as it relates to their academic achievement. It is on this basis that this paper is tailored towards examining the influence of students' variables such as interest, attitude and self-concept on the academic achievement of technical colleges' students' in Mathematics in Ogoja Education zone.

Statement of Hypotheses

The following hypotheses were generated to aid this study;

i. There is no significant influence of attitude on students' academic achievement in Mathematics.
ii. There is no significant influence of interest on students' academic achievement in Mathematics
iii. Self-concept has no significant influence on students' academic achievement in Mathematics.

Research Methodology

Survey research design was adopted for this study. Two hundred (200) students were randomly sampled from ten (10) government technical colleges with a population of 1720 students' within Ogoja education zone, for the study using hat and draw method. This was to ensure that all the subject have equal chance of being selected. Instruments used for data collection in this study were a validated fifteen (15) items structured four point Likert type Scale questionnaire on students' variables with a reliability coefficient of 0.78 established through Cronbach Alpha and a 20 items self-designed Mathematics Achievement Test (MAT) for SS3 students. The instruments designed for the study were administered by research assistance, after due assessment, data collected were analyzed using independent t-test.

Table 1

Distribution of Sample

S/N	Technical Colleges in Ogoja Educational Zone	No of SS3 students	Sample Size
1.	Govt. Technical College Bebi-Obanliku	168	20
2.	Bendi Technical College-Obanliku	182	20
3.	Clement Ebri Technical College, Obudu	194	20
4.	Govt. Technical College Ikwomikwo-Obudu	126	20
5.	Govt. Technical College Igakem-Bekwarra	133	20
6.	Govt. Technical College Ukpa-Bekwarra	188	20
7.	Govt. Technical College Abakpa Ogoja	209	20
8.	Govt. Technical College Ibil Ogoja	167	20
9.	Technical College Ukelle – Yala	169	20
10.	Govt. Technical College Okpoma-Yala	184	20
	Total	1720	200

Results

Hypothesis One

There is no significant influence of attitude on students' academic achievement in Mathematics in Government Technical Colleges in Ogoja Educational Zone

Table 2
Independent t-test analysis of the influence of attitude on students' academic achievement in mathematics.

N = 200

Attitude	**N**	$\bar{X}$	**SD**	**T-value**
Students with Positive attitude	88	24.62	3.99	
				3.06
Students with Negative attitude	112	21.47	2.81	

Significant at 0.05, df = 198, critical t = 1.64

The result in Table 2 revealed the calculated t-value of 3.06 as greater than the critical t-value of 1.64 at 0.05 level of significance and 198 degree of freedom.

Hence, the null hypothesis was rejected. This implies that there is significant influence of attitude on students' academic achievement in Mathematics in Government Technical Colleges in Ogoja Educational zone of Cross River State.

Hypothesis Two

There is no significant influence of interest on students' academic achievement in Mathematics in government technical colleges in Ogoja Education zone of Cross River State.

Table 3
Independent t-test analysis of the influence of interest on students' academic achievement.

N = 200

Interest	**N**	$\bar{X}$	**SD**	**t-value**
Students with interest	96	20.42	3.80	
				2.61
Students without interest	104	18.36	2.11	

Significant at 0.05, df = 198, critical t = 1.64

The result in Table 3 above, reveals the t-calculated as 2.61 which is statistically greater than the tabulated t-value of 1.64 at 198 degree of freedom. On this note, the null hypothesis was rejected and the alternative upheld. This means that there is a significant influence of interest on students' academic achievement in government technical colleges in Ogoja Education zone, Cross River State.

Hypothesis Three

Self-concept has no significant influence on students' academic achievement in Mathematics

Table 4

Independent t-test analysis of the influence of self-concept on students' academic achievement in Mathematics.

Self-Concept	**N**	**$\bar{X}$**	**SD**	**t-value**
High	92	27.64	4.72	
				2.80
Low	108	22.31	3.48	

Significant at 0.05, df = 198 critical-t = 1.64

The above result shows that the calculation t-value of 2.80 is higher than the critical t-value of 1.64 at 198 degree of freedom. Hence, the null hypothesis was rejected. Therefore, implying that self-concept significantly influence students' academic achievement in Mathematics.

Discussion of Findings

The result of the first hypothesis revealed a significant influence of attitude on students' achievement in Mathematics. These findings are in line with Akinyemi (2009) who conducted a similar study and found that improved students' attitude in science generally and Mathematics in particular will enhance performance in the subject. Similarly, the findings supported Owodeji and Harbor-Peters (2000), who found that students' achievement in Mathematics can be better, if only the right attitude is stimulated and sustained towards the subject.

The result of the second hypothesis, showed that interest significantly influence students' academic performance in Mathematics. This finding is in agreement with the findings of Adie (2013) who in a related study on interest, found out that positive interest in Mathematics leads to better achievement.

The result of the third hypothesis reveals that there is a significant influence of self-concept on students' academic achievement in Mathematics, Hence, this help to build the students' self-confidence. These findings collocate the study of Peralta (2004), who found that pupils with positive self-concept perform better in Mathematics and English. The finding of this study also supported Suleiman and Elizabeth (2012) in a related study on relationship between self-concept and academic achievement. Result showed that, there is significant relationship between self-concept of secondary school science students and their academic achievement in Katsina State.

Conclusion

Based on the findings and discussions presented in this study, the following conclusions were drawn; that there is a significant influence of attitude on students' academic performance in Mathematics, that there is a significant influence of interest on students' academic performance in Mathematics, that there is a significant influence of self-concept on students' academic performance in Mathematics.

Recommendations

Based on the findings and conclusions on this study, the following recommendations were put forward.

1. School administrators should employ Mathematics teachers with good mastery of the subject, that can stimulate and sustain students' attitudes.
2. Parents and teachers should try to encourage their wards (children) to become interested in Mathematics by properly orientating them on the need to study as to perform well.
3. Proprietors of schools and government should endeavour to provide necessary instructional materials that when used in teaching, will build students' confidence in all subject including Mathematics.

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