DETERMINANTS OF MATHEMATICS STUDENT'S ACADEMIC ACHIEVEMENT IN JUNIOR SECONDARY SCHOOLS IN OGBA/EGBEMA/NDONI LOCAL GOVERNMENT AREA, RIVERS STATE

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ABSTRACT: The study examined determinants of mathematics student's academic achievement in Junior Secondary School in Ogba/Egbema/Ndoni Local Government Area, Rivers State. A descriptive survey design guided the study. The population of the study was 3332 which comprised 3212 junior secondary school students and 120 junior secondary school mathematics teachers in Ogba/Egbema/Ndoni Local Government Area. Multiple stage sampling method was used to select 368 junior secondary school students and 48 junior secondary school mathematics teachers. Three research questions were answered. The instrument of the study was a survey questionnaire that was partitioned into three sections, structured in the pattern of Likert 5-point rating scale of agreement. The reliability coefficient of the rating scale was 0.78. Mean and Standard Deviation were used to answer the research questions, while z-test statistical tool was used to test the hypotheses at 0.05 level of significance. The study found that constant reading, good student/teacher relationship, student interest in mathematics, on the job training, self-evaluation of teachers, feedback to parents on students' performance, provision of relevant mathematics material, regular visit of parents' student schools and exposure of students to mathematics ambassadors. Therefore, it was recommended that mathematics students should be encouraged to have role models in mathematics and to build good relationship with their mathematics teachers to enable them have the liberty to learn more even after school hour.

KEYWORDS: Academics Achievement, Determinant, Mathematics Students

INTRODUCTION

Nations and individuals all over the world agree that the way out of series of bondages plaguing them is through education, thus the educational system put in place must produce individuals that will meet the needs of the society (Olaniyonu, Adekoya & Gbenu, 2008). In the same vein, Abdul-Karren (2001) asserted that education has been universally recognized as investments of benefits and contribution of national development. Again, Olowu, Chile, Nwanji, Ali and Nwokocha (2015) affirm that education must be continuous in order to enhance the growth of the society.

Based on the foregoing, education can be seen as a very pertinent tool to humans for the development of the society and nation at large. The quality of education is often a great concern in virtually all countries, largely because both national and international assessment of learning outcome continues to reveal an alarming, weak and uneven level of achievement in many countries of the world at large (UNESCO, 2003).

Consequently, for effective educational system, Nigeria has been involved in one educational reform or the other. Notable among these reforms is the 6-3-3-4 system of education. According to Uwaifo and Uddin (2009), this reform was as a result of the transformation in

educational systems of some African countries to meet with the challenges of globalization, occasioned by their need for industrialization and technological development. This is a type of educational system wherein the recipient of the education would spend six years in the primary school, three years in the junior secondary school, three years in the senior secondary school, and four years in the tertiary institutions (Uwaifo & Uddin, 2009). Kpolovie, Joe and Okoto (2014) opined that secondary education plays a crucial role in laying the foundation for the further education of students. If a good foundation is laid at the secondary school level, students can better cope with the challenges of life and profession with great ease. Hence, it is expected that students should be able to have the basis of their career, especially, subjects, such as; English language and mathematics that are regarded to be compulsory for admission virtually into all the fields of study. The formal is necessary in terms of developing the communication skills of students, while the latter is a subject that is necessary for the training of engineers, scientists, technologist and other careers that contributes to technology development in the country. Therefore, student's academic achievement in this subject is worthwhile for development.

Academic achievement refers to the observed and measured aspect of a student's mastery of skills and subject contents as measured with valid and reliable tests (Joe, Kpolovie, Osonwa & Iderima (2014). A student's academic performance is usually measured by teacher-made tests or standardized tests which in most cases are referred to as external examinations like the Junior Secondary examination, Senior School Certificate Examination (SSCE) conducted in Nigeria by the West African Examination Council (WAEC) and the National Examination Council (NECO) (Kpolovie, Ololube & Ekwebelem, 2011). However, the academic achievement of students may result from environmental factors which include education funding, the student, home, school administration, teacher, cultural and educational policy. In the same vein, Kpolovie, Joe and Okoto (2014) noted that there are three major distinct groups of factors that have been found by psychologists to influence academic achievement, such as; student characteristics, home environment and school context.

However, in line with the above, Isangedighi in Kpolovie, Joe and Okoto (2014) noted that academic achievement depends on the amount of time a child is actively engaged in learning because, the time spent on studying helps students to retain the materials learnt which may also boost the student's academic performance during test or examination. Also, Alamieyeseigha and Kpolovie (2013) opined that when teacher is able to initiate creative activities in the school it enhances students learning ability and also influences their academic achievement in examination. Furthermore, Donkor (2010) stated that children whose parents are involved in their education have higher level of academic performance than those whose parents are involved in a lesser degree.

Academic achievement in mathematics is what Nigeria is anticipating to come into play in the learning environment. Students' academic achievements in mathematics plays an important role in producing the best quality graduates that will become great assets for the country, thus responsible for the country's economic and social development (Olowu *et.al.*, 2009). A number of studies have been carried out to identify the factors that affect academic performance of students in a number of educational institutions worldwide. Most of these studies focus on three elements, that is, parents (family causal factors), teachers (academic causal factors) and students (personal causal factors) (Crosnoe, Johnson & Elder, 2004). The combination of these factors influencing academic performance however varies from one academic environment to another, from one set of students to the next and indeed from one

cultural setting to another (Diaz, 2003). Therefore, this present study examined the determinants of mathematics student's academic achievement in Junior Secondary Schools in Ogba/Egbema/Ndoni Local Government Area, Rivers State.

Statement of the problem

Mathematics has been regarded as a subject that can be applied in almost all the disciplines, hence the need for students to have a minimum credit mark before gaining admission into the University. Basically, it is expedient for students to have good knowledge of this subject, since this will in no small measure contribute to manpower development in the country. Unfortunately, it is observed that students at the junior secondary perceive mathematics to be one of the difficult subjects. This could be affirmed by the record of academic performance of junior secondary school students in Ogba/Egbema/Ndoni Local Government Area which shows that students perform better in other subjects than mathematics. However, while we talk about the causes of student's poor performance in mathematics, we should also consider the factors that can determine mathematics student's academic achievement in junior secondary school level. It is against this backdrop that the researcher deemed it fit to investigate the determinants of mathematics student's academic achievement in Junior Secondary Schools in Ogba/Egbema/Ndoni Local Government Area, Rivers State.

Purpose of the study

The study focused on the determinants of mathematics student's academic achievement in Junior Secondary Schools in Ogba/Egbema/Ndoni Local Government Area, Rivers State. Specifically, the study sought to:

- 1. Ascertain student's factors that determine mathematics student's academic achievement in Junior Secondary Schools in Ogba/Egbema/Ndoni Local Government Area, Rivers State.
- 2. Ascertain teacher's factors that determine mathematics student's academic achievement in Junior Secondary Schools in Ogba/Egbema/Ndoni Local Government Area, Rivers State.
- 3. Identify parental factors that determine mathematics student's academic achievement in Junior Secondary Schools in Ogba/Egbema/Ndoni Local Government Area, Rivers State.

Research Questions

In order to achieve the objective(s) of this study, the following questions were tendered.

- 1. What are the student's factors that determine mathematics student's academic achievement in Junior Secondary Schools in Ogba/Egbema/Ndoni Local Government Area, Rivers State?
- 2. What are the teacher factors that determine mathematics student's academic achievement in Junior Secondary Schools in Ogba/Egbema/Ndoni Local Government Area, Rivers State?

3. What are the parental factors that determine mathematics student's academic achievement in Junior Secondary Schools in Ogba/Egbema/Ndoni Local Government Area, Rivers State?

Hypothesis

The following null hypotheses were postulated for this study:

- 1. There is no significant difference in the mean responses of teachers and students on student's factors that determine mathematics student's academic achievement in Junior Secondary Schools in Ogba/Egbema/Ndoni Local Government Area, Rivers State.
- 2. There is no significant difference in the mean responses of teachers and students on teacher's factors that determine mathematics student's academic achievement in Junior Secondary Schools in Ogba/Egbema/Ndoni Local Government Area, Rivers State.

METHODOLOGY

Descriptive survey design was used for the study. The area of the study was Ogba/Egbema/Ndoni Local Government Area, which is a Local Government Area in Rivers State. The population of the study was 3332 which comprised 3212 junior secondary school students and 120 junior secondary school mathematics teachers in Ogba/Egbema/Ndoni Local Government Area. Multiple stage sampling method was used to select 368 junior secondary school students and 48 junior secondary school mathematics teachers. Structured survey questionnaire titled "Determinants of Mathematics Students Academic Achievement" (DMSAA) served as the instrument for data collection. The instrument was partitioned into three sections (A, B & C) that were structured in the pattern of Likert 5-point rating scale of agreement. The face validity of the instrument was ascertained by two experts in the Department of Science Education, Rivers State University. More so, the instrument was subjected to test of reliability using Cronbach Alpha reliability Coefficient method. The reliability coefficients established was 0.78. Copies of the instrument were administered and retrieved by the researchers at the spot. Mean and Standard Deviation were used to answer the research questions while z-test statistical tool was used to test the hypotheses. Mean scores < 3.00 were rejected while Mean scores > 3.00 were accepted

RESULTS AND DISCUSSIONS

Table 1: Responses on student's factors that determine mathematics student's academic achievement in Junior Secondary Schools in Ogba/Egbema/Ndoni Local Government Area

		Stude	ents (n:	=368)	Teachers (n=48)			
S/N	Students factors	Μ	SD	Remark	Μ	SD	Remark	
1	Constant reading	3.64	.17	Accept	3.74	.16	Accept	
2	Building good student/teacher	3.76	.16	Accept	4.34	.17	Accept	

	relationship						
3	Adoption of role model in	4.08	.14	Accept	3.58	.39	Accept
	mathematics			-			-
4	Good questioning skill	4.20	.18	Accept	3.74	.07	Accept
5	Interest in mathematics	3.94	.16	Accept	4.06	.16	Accept
6	Dedication to study	4.24	.14	Accept	3.66	.17	Accept
7	Decision to be the best	3.36	.19	Accept	3.49	.08	Accept
	Grand M & SD	3.89	.16	Accept	3.80	.17	Accept

Source: Field Survey, 2018

Table 1 showed students and teachers responses on student's factors that determine mathematic student's academic achievement in junior secondary school in ONELGA. Based on the mean responses of respondents, respectively, it was accepted that the following student factors determine mathematic student's academic achievement in junior secondary schools: constant reading (3.64 & 3.74), building good student/teacher relationship (3.76 & 4.34), adoption of role model in mathematics (4.08 & 3.58), good questioning skill (4.20 & 3.74), interest in mathematics (3.94 & 4.06), dedication to study (4.24 & 3.66) and decision to be the best (3.36 & 3.49). This finding is in line with Isangedighi in Kpolovie, Joe and Okoto (2014) which noted that academic achievement depends on the amount of time a child is actively engaged in learning because, the time spent on studying helps students to retain the materials learnt which may also boost the student's academic performance during test or examination.

Table 2: Responses on teacher's factors that determine mathematics student's academic achievement in Junior Secondary Schools in Ogba/Egbema/Ndoni Local Government Area

		Stud	lents (n	=368)	Teachers (n=48)		
S/N	Teacher factors	Μ	SD	Remark	Μ	SD	Remark
1	On the job training	3.36	.19	Accept	3.80	0.17	Accept
2	Creativity	3.78	.17	Accept	3.34	0.21	Accept
3	Passion for teaching	4.30	.03	Accept	3.58	0.17	Accept
4	Dedication to duty	4.12	.12	Accept	3.56	0.13	Accept
5	Self-evaluation	3.82	.18	Accept	3.34	1.86	Accept
6	Regular assessment of students	3.88	.16	Accept	3.44	0.15	Accept
7	Good innovative skills	3.24	.17	Accept	3.64	0.23	Accept
8	Creating of good student/teacher	4.28	.24	Accept	3.54	0.20	Accept
	relationship						
9	Regular feedback to parents	3.91	.15	Accept	3.49	0.43	Accept
10	Motivation of students	3.58	.18	Accept	3.56	0.20	Accept
11	Enforcement of discipline	3.38	.18	Accept	3.56	0.17	Accept
12	Good teaching skills	3.62	1.19	Accept	3.38	0.21	Accept
	Grand M & SD	3.77	.25	Accept	3.52	.34	Accept
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Source: Field Survey, 2018

Table 2 showed students and teachers responses on teacher's factors that determine mathematic student's academic achievement in junior secondary school in ONELGA. Based on the mean responses of respondents, respectively, it was accepted that the following teacher's factors determine mathematic student's academic achievement in junior secondary schools: on the job training (3.36 & 3.80), creativity (3.78 & 3.34), passion for teaching (4.30 & 3.58), dedication to duty (4.12 & 3.56), self-evaluation (3.82 & 3.34), regular assessment of students (3.88 & 3.44), good innovative skills (3.24 & 3.64), creating of good student/teacher relationship (4.28 & 3.54), regular feedback to parents (3.91 & 3.49), motivation of students (3.58 & 3.56), enforcement of discipline (3.38 & 3.56) and good teaching skills (3.62 & 3.38). This finding corroborates Alamieyeseigha and Kpolovie (2013) which opined that when a teacher is able to initiate creative activities in the school it enhances students learning ability and also influences their academic achievement in examination.

Table 3: Responses on parent's factors that determine mathematics student's academic achievement in Junior Secondary Schools in Ogba/Egbema/Ndoni Local Government Area

		Studen	nts (n=3	868)	Teachers (n=48)		
S/N	Parent factors	Μ	SD	Remark	Μ	SD	Remark
1	Provision of relevant mathematics materials	3.24	0.20	Accept	3.36	0.06	Accept
2	Provision of enabling environment	3.46	0.21	Accept	3.32	0.01	Accept
3	Counseling of wards	3.86	0.18	Accept	3.26	0.19	Accept
4	Regular visit to school	3.62	0.19	Accept	3.38	0.18	Accept
5	Good relationship with teachers	3.36	0.19	Accept	3.04	0.18	Accept
6	Encouragement of wards	3.36	0.18	Accept	3.44	0.07	Accept
7	Exposure of wards to mathematics	3.42	0.20	Accept	3.26	0.19	Accept
	ambassadors						

Source: Field Survey, 2018

Table 3 showed students and teachers responses on parent's factors that determine mathematic student's academic achievement in junior secondary school in ONELGA. Based on the mean responses of respondents, respectively, it was accepted that the following teacher's factors determine mathematic student's academic achievement in junior secondary schools: provision of relevant mathematics materials (3.24 & 3.36), provision of enabling environment (3.46 & 3.32), counseling of wards (3.86 & 3.26), regular visit to school (3.62 & 3.38), good relationship with teachers (3.36 & 3.04), encouragement of wards (3.36 & 3.44) and exposure of wards to mathematics ambassadors (3.42 & 3.26). This study is in conformity with Donkor (2010) which stated that children whose parents are involved in their education have higher level of academic performance than those whose parents are involved in a lesser degree.

Hypothesis 1: There is no significant difference in the mean responses of teachers and students on student's factors that determine mathematics student's academic achievement in Junior Secondary Schools in Ogba/Egbema/Ndoni Local Government Area

Category	Μ	SD	Ν	DF	z-cal	z-crit	Remark
Students	3.89	.16	368				
				414	3.47	1.96	S
Teachers	3.80	.17	48				

Table 4: z-Test on students factor that determine mathematics students' academic achievement

Table 4 showed that students had mean and standard deviation score of 3.89 and .16 respectively, while teachers had mean and standard deviation scores of 3.80 and .17 respectively. The z-cal value was 3.47, while the z-crit was 1.96 at 0.05 level of significance for two tailed tests. This result shows that z-cal was greater than z-crit, which means that the null hypothesis was rejected. Thus, there was a significant difference in the mean responses of students and teachers on student's factors that determines mathematics student's academic achievement in Junior Secondary School in ONELGA.

Hypothesis 2: There is no significant difference in the mean responses of teachers and students on teacher's factors that determine mathematics student's academic achievement in Junior Secondary Schools in Ogba/Egbema/Ndoni Local Government Area

Table 5:	z-Test	on	teacher's	factor	that	determine	mathematics	students'	academic
achievem	ent								

Category	Μ	SD	Ν	DF	z-cal	z-crit	Remark
Students	3.77	.25	368				
				414	4.92	1.96	S
Teachers	3.52	.34	48				

Table 5 showed that students had mean and standard deviation score of 3.77 and .25 respectively, while teachers had mean and standard deviation scores of 3.52 and .34 respectively. The z-cal value was 4.92, while the z-crit was 1.96 at 0.05 level of significance for two tailed tests. This result shows that z-cal was greater than z-crit, which means that the null hypothesis was rejected. Thus, there was a significant difference in the mean responses of students and teachers on teacher's factors that determine mathematics student's academic achievement in Junior Secondary School in ONELGA.

CONCLUSION

Based on the finding of the study, it was deduced that with constant study, good relationship with teachers, adoption of role model, good questioning skills, interest in mathematics and dedication to study, student's performance in mathematics will improve. Also, the study concluded that on the job training, creativity, passion for teaching, dedication to duty, selfevaluation, regular assessment of students, among others are teacher factors that can improve students' academic performance in mathematics. Finally, the study concluded that provision of relevant mathematics material, provision of enabling environment for study, counseling, regular visit to school and many more are parent factors that determines mathematics students' academic achievement in mathematics in Junior Secondary Schools in Rivers State.

RECOMMENDATIONS

The following recommendations were made:

- 1. Mathematics students should be encouraged to have role models in mathematics. This will enhance their interest in mathematics.
- 2. Mathematics students should develop good relationship with their mathematics teachers to enable them have the liberty to learn more even after school hour.
- 3. Mathematics teachers should also embark on training to enable them learn new methods of teaching mathematics concepts and other things that will enhance their teaching.
- 4. Mathematics teachers should always report to their students' parents in order for parents to have good knowledge of their ward's achievement in mathematics.
- 5. Parents should provide enabling environment for their wards to enable them have better study.
- 6. Parents should visit their wards schools to have knowledge of their ward's performance. This will enable students to focus more in his/her studies.

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