Research Article

HOME, SCHOOL AND STUDENTS' CHARACTERISTICS AS PREDICTORS OF SENIOR SECONDARY SCHOOL STUDENTS' ACHIEVEMENT IN MATHEMATICS

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TO CITE THIS ARTICLE:
Okunola, J. O. ., & Obot, P. F. . (2024). HOME, SCHOOL AND STUDENTS' CHARACTERISTICS AS PREDICTORS OF SENIOR SECONDARY SCHOOL STUDENTS' ACHIEVEMENT IN MATHEMATICS. Turkish Journal of Computer and Mathematics Education (TURCOMAT), 15(2), 195–205. https://doi.org/10.61841/turcomat.v15i2.14346

ABSTRACT
Students' performance in mathematics in Nigeria in recent times is not at a desired level. Despite relentless efforts by stakeholders to improve this situation, yet no significant change. Studies that looked into student's variables combined with importance of mathematics, teacher, school, and parent variables to predict students' achievement in mathematics, seem not to be in existence. Thus, empirical documentation of such is needful. This study assessed home, school and students' characteristics as predictors of Senior Secondary School students' achievement in Mathematics in Osun State. Expo-facto design of non-experimental type was used. Descriptive statistics and Multiple Regression were used to analyze data at 0.05 alpha level. Results reveal that parenting type, family size, teachers qualification, years of teaching, class size, interest in mathematics, student academic engagement, and importance of mathematics, jointly accounted for 11% of observed variance in achievement in Mathematics, and it is statistically significant, $F(17,575) = 5.183$; $P < 0.05$. Also, importance of mathematics, student engagement, teachers' qualification, class size and teacher years of teaching, were found to have significant relative contribution towards students' achievement in mathematics, and they could reliably predict achievement in mathematics.

Keywords – School and Students' Characteristics, Determinants, student engagement, Mathematics Achievement, Osun State

1. INTRODUCTION

Mathematics plays a major role in the development of most nations. Thus, technologically developed societies depend largely on Advancement in Science, and Mathematics. Today, improved knowledge of Mathematics form an imperative step towards realization of several digital, physical and biological innovations which drives the fourth industrial revolutions. Mathematics is a core subject which presents, and connects principles, models, operations, as well as abstract concepts towards providing solutions to real life problems. It concerns the study of theoretical computations of numbers, manipulation of objects, stochastic predictions among others. It is a compulsory subject in secondary schools and one of the majorly required subject for students aspiring to study science related courses and humanities in Nigerian tertiary institutions. Many studies and literatures (Sunita Yadav, 2019; Capecchi, Buscema, Contucci and D'Amore, 2010), have stressed the roles and contributions of mathematics and numerical skills to various human activities. However, despite this importance of mathematics, there is a worrying level of achievement of Nigerian students as observed from their performance in most senior secondary schools' external examinations. Although, studies have been done on how to overcome the problem of low performance in mathematics, and to enhance students' achievement in mathematics at all levels of education (Foster, Anthony, Clement, Sarama and Williams (2016); Bai, Pan, Hirumi, and Kebritchi, 2012; Kaloo and Mohan, 2012; Abdullahi and Onasanya, 2010; and Kolawole and Popoola, 2009). In spite of these efforts made at different levels, students' performance in the subject is still not at the desired level.

Most of the previous studies concentrated efforts on parent, students, teachers or school variables or at most a combination of two of these variables to predict achievement in mathematics. Thus, this study looked into student's variables combined with importance of mathematics, alongside teacher, school and parent variables to predict students' achievement in mathematics. This study provides empirical evidence on the link among home, school and students characteristics on learning outcomes in senior secondary school mathematics. It also provide answers to the pattern of students' interest in Mathematics; the pattern of students' Academic Engagement in Mathematics; the extent of Mathematics importance to the Students; the composite contribution of predictor variables (Parenting type, Family size, Teachers qualification, Years of teaching, Class size, Interest in Mathematics, student academic engagement and importance of Mathematics) to Mathematics Achievement as well as, the relative contribution of predictor variables (Parenting type, Family size, Teachers qualification, Years of teaching, Class size, Interest in Mathematics, student Academic Engagement and Importance of Mathematics) to Mathematics Achievement. Clarity of the empirical evidence

of these variables on learning outcomes will provide information for current educational practices for secondary schools as well as provide direction for future educational policy.

2. LITERATURE REVIEW

Several factors that contributed to low performance are related to home (parents), schools (teachers), students and even the government. Studies on the effects of home factors such as parenting style on school achievement revealed that the home and the school have been identified as the two major factors that can influence children's performance to improve learning achievement (World Bank; 2000). Studies have also shown that educational level of parents indicate a positive influence on family size and (Frances, Azumah, Adjei & Nachinaab, 2017) noted that family size may in turn influence the support children receive from home, with large family size having negative influence on children education in suburb. Authur (2006) reported that parents with tertiary education were seen to represent those with smaller family size and that the level of education of siblings is influenced by the number of children in the family.

It is hoped that if the schools, parents and teachers provide an enabling environment that will enhance mathematics learning, it will be possible to sustain and improve the present level of performance in Mathematics by our students. Maphoso and Mahlo (2015) remarked that a well-trained teacher with good command of his/her subject matter will be able to identify the weakness and strengths of his /her students' thereby making learning and teaching simpler. Being able to identify weaknesses of students may lead to improved interest and achievement of students in the subject. Abe, 2014; Jega and Julius, 2018; and Oladokun (2010) emphasized that teachers' academic qualification, and experience have significance on students' achievement in mathematics. Students taught by teachers with higher qualifications achieved better than those taught by teachers with lower qualifications. Goldhaber and Brewer (2000) found a positive relationship between the result of students and teachers with bachelor or master's degree in mathematics than those from other fields. This explains the important role that area of specialization/qualification could play on achievement in mathematics. Most schools in Nigeria operate without competent and qualified mathematics teachers. Most of these schools engage the services of graduates of economics, geography, physics, chemistry, biology and even agricultural science to teach mathematics.

Interest in school subject can facilitate academic positive outcomes as it can be linked with achievement in the subject. Academic interest and attitude can be defined as a student's enduring disposition, positive affective orientation, and tendency to persevere when working on certain specific academic content or task. Anigbo and Idigo (2015) argued that students' interest in learning mathematics can be affected by several factors including class size, and instructional strategy. Tembe, Anyagh & Abakpa (2020) identified a significant relationship between mathematics interest and students' achievement in mathematics. Attitude is a component of interest because individual interest can be regarded as positive attitude towards a subject. Olaoye (2005) explained that attitude of the learner to a subject will determine the measure of the learner's attractiveness or repulsiveness to it. Students' attitude to mathematics may determine the extent to which they are engaged with their mathematics school work. This is supported by Sa'ad, Adamu and Sadiq (2014) which revealed that developing a positive attitude, improve performance in mathematics; also students' negative attitude and inadequate qualified teachers were some of the causes of poor performance in mathematics.

Academic engagement could be seen as the interest, the determination, and the passion of students towards learning and teaching. Therefore, academic engagement shows the relationship between non cognitive factors such as attitude, interest, perseverance, and learning outcomes. Deneen (2010) argued that academic engagement manifest when students take academic challenge (i.e students directed learning, and collaborative learning). Student also show signs of being engaged academically when they are into relationship with school staff that could help them improve their progress in school and when they participate in enriching educational programs that can complement school learning, such as independent study with use of electronic devise to augment learning. Fredricks, Blumenfield and Paris (2004) postulated that academic engagement occurs along a continuum and can be categorized into three, namely: cognitive academic engagement, behavioral academic engagement, and emotional academic engagement. Academic engagement is therefore a prerequisite to learning and learners must be cognitively engaged for learning to take place. When learners are cognitively engaged, it will produce improved learning outcomes in mathematics. Maamin, Maat & Iksan (2021) noted a significant relationship between cognitive engagement, affective engagement, behavioral engagement and Mathematical achievement and recommended activities that promotes such engagements.

Research Questions

1. What is the pattern of students' interest in Mathematics?
2. What is the pattern of students' Academic Engagement in Mathematics?
3. To what extent is Mathematics important to the Students?
4. What is the composite contribution of predictor variables (Parenting type, Family size, Teachers qualification, Years of teaching, Class size, Interest in Mathematics, student academic engagement and importance of Mathematics) to Mathematics Achievement?
5. What is the relative contribution of predictor variables (Parenting type, Family size, Teachers qualification, Years of teaching, Class size, Interest in Mathematics, student Academic Engagement and Importance of Mathematics) to Mathematics Achievement?

3. METHODOLOGY

The Research Design

This study is a survey. It is an Expo-facto type of non-experimental design.

Variables of the study

A. Independent variables: Parenting type, Family size, Teacher qualification, Teacher years of teaching, Class size, Importance of Mathematics, Student's Interest in mathematics, Student academic engagement.

B. Dependent variable: Achievement in mathematics

Sampling Technique

This study adopted multistage sampling. The different stages of sampling were at the local government (LG), school and classroom levels. There are 3 senatorial districts in Osun State of which this work covered 2; purposive sampling procedure was used to select a rural LG from each senatorial district and random sampling procedure was adopted to select two urban LGs areas making a total of six LGs from the senatorial districts. Rural and urban schools were used to have heterogeneous groups for the sample. Furthermore, three public and one private schools were randomly selected from each of the selected LGs. One arm of Senior Secondary School year two (SSS2) students of Science, Arts and Commercial classes were sampled and intact classes were used. The mathematics teachers, teaching those classes were included in the sample for this study. Table 1, presents the number of public and private secondary schools sampled for the study.

Table 1. Number of public and private secondary schools sampled from LGs selected from each senatorial district in Osun state.

Senatorial District	Name of LG sampled	No. of schools sampled from each LG	No. of Public School Sampled from each LG	No. of Private School from each LG	No. of students sampled	No. of teachers sampled
OSUN EAST (10 LG)	Ilesa East (urban)	4	3	1	106	4
	Ife Central (urban)	4	3	1	110	4
	Ife North (rural)	4	3	1	96	4
OSUN WEST (10 LG)	Ede North (urban)	4	3	1	78	4
	Aiyedire (urban)	4	3	1	96	4
	Iwo (rural)	4	3	1	107	4
Total	**6 LG**	**24**	**18**	**6**	**593**	**24**

Sample

Sample for the study from the results consisted of, 593 SS2 students (379 females and 214 males; ages between 12 and 20years), and 24 mathematics teachers (6 female and 18 male; ages between 23 and 56years). Out of the students sampled, 454 are from families of size 1 to 5, 122 students are from families of size 6 to 10 and 4 are from families of size 11 to 15. Out of the students, 83 are from single parents while 504 students are from dual parents. Out of the 24

sampled teachers, 3 are Master's degree holders, 17 have first degree, 1 is HND holder and 1 has NCE certificate. From the teachers sampled, 20 have mathematics as area of specialization, 2 read Statistics, and 2 are graduates of Chemistry respectively. Out of the teachers, 5 have their years of teaching from 18 to 25 years, 11 have from 10 to 17 years and 8 have from 2 to 9 years. From the teachers, 17 teach classes of size of 39 to 52, 1 teaches average class size of 25 to 38 and 6 teach classes of size of 11 to 24.

Instrumentation

Three instruments were used to collect data for this study; they are: Students Questionnaire, Teachers Questionnaire, and Mathematics Achievement Test (MAT)

(i) Students Questionnaire

The students' questionnaire is a four likert scale with two sections. Section A provided demographic information about the respondents, it also provided information on the number of children in the family and parenting type. Section B comprised; Importance of Mathematics Scale (IMS) with 8 items, Students Engagement Scale (SES) with 12 items and Students Mathematics Interest Scale (SMIS) with 15 items.

(ii) Teachers Questionnaire

Teachers Questionnaire has only one section which was used to elicit information on the demographic data of the respondents. It also gave information on qualification, years of teaching, Average class size taught and area of specialization.

(iii) Mathematics Achievement Test for Students (MATS)

The Mathematics Achievement Test for Students (MATS) was constructed using the New General Mathematics textbook for Senior Secondary Schools. It has two sections (i.e. A and B). Section A provided demographic information of the respondents while section B with 40 multiple choice Mathematics questions with four options from A to D. The selected items covered: Number and Numeration, Algebraic Processes, Geometry and Mensuration and Statistics and Probability. Kuder-Richardson formula was used to estimate the Reliability and it was 0.85.

Methods of Data Analysis

Quantitative method was used to analyze the data. The researcher made use of descriptive statistics and multiple regression in order to answer the stated research questions at 0.05 level of significance. In order to know the specific variables that predicted Senior Secondary School students' mathematics achievement in this study, dummy variables of some of the Independent variables (parenting type, family size, teachers' qualification, teachers' years of teaching and class size) were adopted in the analysis.

4. RESULTS

Research question 1

What is the pattern of students' interest in Mathematics?

Table 2. The Pattern of Students' Interest in Mathematics

S/N	Item	SA	A	D	SD	N
		Freq(%)	Freq(%)	Freq(%)	Freq(%)	
1	I am interested in being able to communicate Mathematical information to others	239(40.3%)	241(40.6%)	64(10.8%)	49(8.3%)	593
		80.9%		19.1%		
2	I look forward to Mathematics lesson	278(46.9%)	249(42.0%)	40(6.7%)	26(4.4%)	
		88.9%		11.1%		593
3	I am interested in understanding Mathematical information	310(52.3%)	227(38.3%)	32(5.4%)	24(4.0%)	
		90.6%		9.4%		593
4	I enjoy Mathematics lesson	257(43.3%)	265(44.7%)	37(6.2%)	34(5.7%)	593
		88%		11.9%		
5	I am interested in using Mathematics	252(42.5%)	232(39.1%)	66(11.1%)	43(7.3%)	593
		81.6%		18.4%		
6	Mathematics is my best subject	164(27.7%)	236(39.8%)	97(16.4%)	96(16.2%)	593

		67.5%		32.6%		
7	I am interested in learning Mathematics	280(47.2%)	224(37.8%)	61(10.9%)	28(4.7%)	593
		84.0%		16.0%		
8	I am always thirsty for more Mathematics knowledge	188(31.7%)	246(41.5%)	100(16.9%)	59(9.9%)	593
		73.2%		26.8%		
9	Mathematics is boring	98(16.5%)	120(20.2%)	165(27.8%)	210(35.4%)	593
		36.7%		63.2%		
10	I wish there were more mathematics classes a week	180(30.4%)	242(40.8%)	98(16.5%)	73(12.3%)	593
		71.2%		28.8%		
11	I would like to spend most of my studying hours on Mathematics	184(31%)	224(37.8%)	115(19.4%)	70(11.8%)	593
		68.8%		31.2%		
12	Life is dull without Mathematics	232(39.1%)	194(32.7%)	104(17.5%)	63(10.6%)	593
		71.8%		28.1%		
13	Mathematics is fun to me	177(29.8%)	239(40.3%)	109(18.4%)	68(11.5%)	593
		70.1%		29.9%		
14	I never get tired of solving Mathematics	149(25.1%)	243(41.0%)	121(20.4%)	80(13.5%)	593
		66.1%		43.9%		
15	I study Mathematics more willingly than any other subject	152(25.6%)	230(38.8%)	114(19.2%)	97(16.4%)	593
		(64.4%)		(35.4%)		

Table 2, shows that about 480 (80.9%) of the sampled students showed interest in being able to communicating mathematical information to others, 527 (88.9%) indicated that they look forward to mathematics lesson. Also, among the sampled students 537 (90.6%) were interested in mathematical information, about 522 (88%) indicated that they enjoyed mathematics lesson, 484 (81.6) showed interest in using mathematics and some 400 (67.5%) indicated that mathematics is their best subject, 504 (84%) showed interest in learning mathematics, 434 (73.2%) always thirst for more mathematics knowledge. Moreover, few 218 (36.7%) viewed that mathematics is boring, about 422 (71.2 %) wished there were more mathematics lesson in a week, some of them 408 (68.8%) indicated that they would like to spend most of their studying hours on mathematics and 426 (71.8%) of them opined that life is dull without mathematics. However, 416 (70.1%) indicated that mathematics is fun to them, some of them 392 (66.1%) showed that they never get tired of solving mathematics and 382 (64.4%) showed that they study mathematics more willingly than any other subjects.

The findings show the general trend of senior secondary school student's interest in mathematics. Result indicated the generality of these secondary school students have interest in mathematics, even though there is a wide disparity among them. It was seen that the level of the interest of these students in mathematics activities is very high, probably due to the fact that mathematics is a compulsory subject in Nigerian secondary schools. Most of the students exhibited interest towards mathematics achievement. One's interest can be used to predict his actions. Psychologically, interest can be described as a hypothetical construct that represents an individual's degree of like for an item. Interest is generally positive views of a person, thing, object or event, few of the students does not show interest in mathematics as a subject. However, the finding supports Tembe, Anyagh & Abakpa (2020) who had identified a significant relationship between mathematics interest and students' achievement in mathematics.

Research Question 2

What is the pattern of students' Academic Engagement in Mathematics?

Table 3. Pattern of Students' Academic Engagement in Mathematics

S/N	Item	SA	A	D	SD	N
		Freq(%)	Freq(%)	Freq(%)	Freq(%)	
1	I plan to complete all of my Mathematics assignments	337(56.8%)	217(36.6%)	20(3.4%)	19(3.2%)	593
		93.4%		6.6%		
2	I plan to work hard in my Mathematics subject	350(59%)	208(35.1%)	21(3.5%)	14(2.4%)	593
		94.1%		5.9%		
3	I pay attention to my Mathematics teacher during lesson/class	338(57%)	228(38.4%)	16(2.7%)	11(1.9%)	593
		95.4%		4.6%		

4	I practice ahead of Mathematics class so as not to miss out in Mathematics lesson	250(42.2%)	246(41.5%)	81(13.7%)	16(2.7%)	593
		83.7%		16.4%		
5	I plan to study hard for every Mathematics test	327(55.1%)	215(36.3%)	34(5.7%)	17(2.9%)	593
		91.4%		86%		
6	I plan to attend every Mathematics class session	334(56.3%)	199(33.6%)	43(7.3%)	17(2.9%)	593
		89.9%		10.2%		
7	I plan to attend every Mathematics class session	352(59.4%)	189(31.9%)	35(5.9%)	17(2.9%)	593
		77.5%		22.5%		
8	I ensure that I do my assignment myself	263(44.4%)	256(43.2%)	43(7.3%)	31(5.2%)	593
		72.6%		27.4%		
9	I like working out complex Mathematics problems	200(33.7%)	246(41.5%)	97(16.4%)	50(8.4%)	593
		75.2%		24.8%		
10	I keep the company of friends who can assist me in Mathematics topics	267(45%)	235(39.6%)	51(8.6%)	40(6.7%)	593
		84.6%		15.3%		
11	I practice Mathematics exercises immediately after the class	184(31%)	280(47.2%)	86(14.5%)	43(7.3%)	593
		78.2%		21.8%		
12	If I don't understand a particular topic I don't hesitate to ask question during Mathematics lesson	220(37.1%)	183(30.9%)	93(15.7%)	97(16.4%)	593
		68%		32.1%		

Table 3, shows that some 554 (93.4%) of the sampled students do plan to complete all their mathematics assignment as their business, 558 (94.1%) indicated planning to work hard in the mathematics subject while 566 (95.4%) viewed paying attention to their mathematics teacher as a necessity. Moderate number 496 (83.7%) of the sampled students indicated that they practice ahead of mathematics class so as not miss out in mathematics lesson, 542 (91.4%) see planning to study hard for every mathematics test as paramount, 541 (89.9%) indicated that they plan to attend every mathematics class lesson, 519(72.6%) students among the sampled students ensure they do their assignment themselves. However, 147 (24.8%) of them indicated that they don't like working out complex mathematics problems, among the sampled students 91 (15.3%) indicated that they don't keep the company of friends who can assist them in in mathematics topics, few of them 129(21.8%) indicated that they don't practice mathematics exercises immediately after the class, some 403 (68%) of them indicated that if they do not understand a particular topic they do not hesitate to ask question during mathematics lesson.

The above analysis indicated the generality that the students were engaged in mathematics activities. However, few students are not engaged in mathematics activities. Most of the students engaged well in planning to do assignment, to work hard in the subject, to pay attention to teacher in the class, to practice ahead of mathematic class, to study hard for mathematics test and to attend mathematics class but few students jettison these. A good number of the students took working complex problems as well as asking questions from the teacher in the class very serious which means that many students understand the part of academic engagement and they make themselves responsible. The more the engagement of students in mathematics activities, the more the higher their chances and level of academic achievement in the subject. These align with Maamin, Maat and Iksan (2021) who reported a significant relationship between student engagement and mathematics achievement.

Research Question 3

To what extent is Mathematics important to the Students?

Table 4. Extent in which Mathematics is Important to the students

S/N	Item	SA	A	D	SA	N
		Freq(%)	Freq(%)	Freq(%)	Freq(%)	
1	Mathematics is required in my professional training	279 (47%)	200 (33.7%)	66 (11.1%)	48 (8.1%)	593
		80.7%		19.2%		

2	Mathematical skills will make me more employable	242 (40.8%)	259 (43.7%)	51 (8.6%)	41 (6.9%)	593
		92.0%		8.0%		
3	Mathematics is not useful at the workplace	56 (9.4%)	97 (16.4%)	189 (39.1%)	251 (42.3%)	593
		40.3%		59.7%		
4	Mathematical thinking is not applicable outside my career/profession	85 (14.3%)	101 (17%)	213 (35.9%)	194 (32.7%)	593
		31.3%		68.6%		
5	Use Mathematics in my everyday life	273 (46%)	225 (37.9%)	52 (8.8%)	43 (7.3%)	593
		53.6%		46.4%		
6	Mathematics knowledge are rarely applied in daily life	203 (34.2%)	218 (36.8%)	100 (16.9%)	72 (12.1%)	593
		71%		29%		
7	I have no application for Mathematics in my future profession	98 (16.5%)	87 (14.7%)	161 (27.2%)	247 (41.7%)	593
		31.2%		68.9%		
8	Mathematics is irrelevant in my life	46 (7.8%)	155 (26.1%)	176 (29.7%)	216 (36.4%)	593
		33.9%		66.1%		

Table 4, shows that about 479 (80.7%) of the sampled students indicated mathematics as a requirement in their professional training, 501 (92%) knew that mathematics will make them more employable, few 153 (40.3%) viewed mathematics as not useful at the workplace, 186 (31.3) % of the students indicated that mathematics thinking is not applicable in their profession, among the sampled students 498 (53.6%) indicated they use mathematics in their everyday life. However, 421(71%) of the students indicated that mathematics knowledge are rarely applied in daily life. Only few students 186(31.2%) ticked no application for mathematics in their future profession and 201 (33.9%) of them showed that mathematics is irrelevant in their lives.

The result revealed that most of the students showed to some extent, the importance of mathematics. Though their future ambitions determine how they see the importance of mathematics, that is, they have more knowledge about the importance of mathematics to their future than their daily life. This can be attributed to the fact that they do not really know the application of mathematics in their daily life.

Research Question 4

What is the composite contribution of predictor variables to Mathematics Achievement?

Table 5. Regression Summary Showing Composite contribution of predictor variables to students' Mathematics Achievement.

R= 0.365 **R square** = 0.133 **Adjusted R square** =0.107					
Model	Sum of square	Df	Means square	F	Sig.
Regression	1954.595	17	114.976	5.183	0.000
Residual	12754.609	575	22.182		
Total	14709.204	592			

Table 5, shows multiple regression correlation coefficient indicating the relationship between the predictor variables (Parenting type, Family size, Teachers qualification, Years of teaching, Class size, Interest in Mathematics, student academic engagement and importance of Mathematics) and Mathematics Achievement indicators is 0.365. The adjusted R square is 0.107, this means that the predictor variables accounted for 11% prediction of achievement of students in Mathematics. Also, it has been further ascertained using multiple regression ANOVA, $F_{(17,575)} = 5.183$; $P<0.05$. This

indicated there is significant linear relationship between the predictor variables and Mathematics Achievement indicators.

Research Question 5

What is the relative contribution of predictor variables (Parenting type, Family size, Teachers qualification, Years of teaching, Class size, Interest in Mathematics, student Academic Engagement and Importance of Mathematics) to Mathematics Achievement?

Table 6. Relative contribution of predictor variables to students' Mathematics Achievement

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	15.967	1.292		12.36	.000
Importance of math.	.136	.058	.098	2.338	.020
Students Interest	-.029	.031	-.049	-.916	.360
Students Engagement	-.100	.044	-.118	-2.266	.024
Teacher Qual.=NCE	5.081	1.163	.201	4.368	.000
Teacher Qual.=HND	-1.252	.703	-.101	-1.781	.075
Teacher Qual.=B.A.Ed.	-2.65	1.096	-.105	-2.417	.016
Teacher Qual.=B.S.Ed.	-1.079	.710	-.085	-1.519	.129
Teacher Qual.=B.Ed.	1.058	1.123	.042	.942	.347
Teacher Qual.=M.Ed.	-.307	1.272	-.012	-.241	.809
Teacher Qual.=M.Sc.	-2.607	.943	-.143	-2.765	.006
Class Size=11-24	1.287	.567	.115	2.271	.024
Class Size=25-38	-3.455	1.099	-.137	-3.143	.002
Teach. yrs. of teaching=10-17	.894	.591	.090	1.511	.131
Teach. yrs. of teaching=18-25	-1.607	.700	-.130	-2.295	.022
Family Size=6-10	.337	.508	.026	.663	.508
Parenting Type=Dual	.053	.571	.004	.092	.927
Family Size=11-15	.171	2.401	.003	.071	.943

Dependent variable: Mathematics Achievement

Table 6, shows that among the predictor variables, only importance of mathematics (β= 0.098, $t(593)$ = 2.338; $p < 0.05$), student engagement (β= -0.118, $t(593)$ = -2.266; $p < 0.05$), teachers qualification NCE (β= 0.201, $t(593)$ = 4.368; $p < 0.05$), teachers qualification B.A.Ed. (β= -0.105, $t(593)$ = -2.417, teachers qualification M.Sc. (β= -0.143, $t(593)$ = -2.765, class size 11-24 (β= 0.115, $t(593)$ = 2.271, class size 25-38 (β= -0.137, $t(593)$ = -3.143 and teacher years of teaching 18-25 (β= -0.130, $t(450)$ = -2.295; $p < 0.05$), were found to have significant relative contribution towards students achievement in mathematics.

5. DISCUSSION

Results indicate the generality of senior secondary school students have interest in mathematics, even though there is a wide variability among them. Their frequency of students' interest in mathematics is reasonably high level. The trend of mathematics frequency of students' engagement in mathematics show positively skewed distribution, where many of the students reported a high level of engagement in mathematics achievement. The generality of these students reported that mathematics is important, though their knowledge about the importance of mathematics, centered on the future benefits rather than their daily life. Majority of the students also reported a high level of importance of Mathematics.

Results also revealed that there is a linear relationship among the variables in the study, R= 0.365, R square = 0.133, Adjusted R square =0.107. Also, all the predictor variables (Parenting type, Family size, Teachers qualification, Years of teaching, Class size, Interest in Mathematics, student academic engagement and importance of Mathematics) jointly

accounted for 11% observed variance in achievement in Mathematics; and it is statistically significant, $F_{(17,575)} = 5.183$; $P<0.05$.

Results also showed that among the predictor variables, variables such as; importance of mathematics (β= 0.098, $t(593) = 2.338$; $p < 0.05$), student engagement (β= -0.118, $t(593) = -2.266$; $p < 0.05$), teachers qualification NCE (β= 0.201, $t(593) = 4.368$; $p < 0.05$), teachers qualification B.A.Ed. (β= -0.105, $t(593) = -2.417$, teachers qualification M.Sc. (β= -0.143, $t(593) = -2.765$, class size 11-24 (β= 0.115, $t(593) = 2.271$, class size 25-38 (β= -0.137, $t(593) = -3.143$ and teacher years of teaching 18-25 (β= -0.130, $t(450) = -2.295$; $p < 0.05$), were found to have significant relative contribution towards students achievement in mathematics.

From this study, it was revealed that (importance of mathematics, students' engagement in mathematics, teachers' qualification NCE, B.A.Ed., M.Sc., class size 11-24, 25-38 and teacher years of teaching 18-25) were most potent factors that influenced students' mathematics achievement as indicators but it means that students and school characteristics majorly predicts senior secondary school students' achievement in mathematics. However, interest in mathematics, parenting type and family size do not influence or predict senior secondary school students' achievement in mathematics. As far as mathematics is important, students' engagement is necessary for better performance, also qualified teachers in education line with higher experience or years of teaching can influence senior secondary school students' achievement in mathematics as well as lesser class size.

6. CONCLUSION

From the findings of this study, it is concluded that Teachers' qualification, Years of teaching, Class size, Interest in Mathematics, student academic engagement and importance of Mathematics are significantly related to the students' achievement in Mathematics and they could reliably predict achievement in mathematics.

7. SUGGESTIONS

Based on the above the following are recommended:

- Programs that will get the students informed about the importance of mathematics to their daily living as well as their future career or profession should be encourage in school.
- School administrators and mathematics Teachers should create platforms for their students for constant engagement in mathematics activities, through the use of classwork, group work, assignment etc.
- Qualified mathematics teachers certified in education and of high degree educational degree should be employed and allow to teach mathematics in secondary schools.
- Class size of at most 38 students should be encouraged
- Teachers with reasonably high years of teaching should be allowed to teach secondary schools.

DECLARATIONS

Author Contributions: The article was written by only two authors, who read and approved the final published version of the article.
Conflicts of Interest: The authors declared no conflict of interest.
Funding: None.
Acknowledgments: None.

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