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Home Educational Resources and Senior Secondary School Students' Academic Achievement in Mathematics in Ibadan Metropolis, Oyo State

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Abstract

Students' performance in The West African Mathematics Examination Council in mathematics as a subject revealed that over the past ten years, Secondary School students' achievement in Mathematics has not improved significantly. Some factors identified as causes include school, home and students related factors. This study investigated the influence of home educational resources on students' academic achievement in Mathematics in Ibadan metropolis. The population of the study consist of all Senior Secondary School two students in all the 813 secondary schools in Ibadan metropolis and teachers of mathematics in these schools. Two self-developed instruments on Home Educational Resources (HERQ)(r=0.842) and Students Mathematics Achievement Test (SMAT)(KR20=0.724) were used to collect data for the study. Descriptive statistics of simple percentages, frequency counts, mean and standard deviation and inferential statistics of Multiple Regression and t-test were used to answer the three research questions and two hypotheses stated. The dependent variable (academic achievement in mathematics) on secondary school students academic achievement, there was significant relative influence of personnel resources at home (B=0.112, t =2.463) on senior secondary school students academic achievement in mathematics, there was significant mean difference (t=3.126, P<0.05) in the mathematics academic achievement of students from private and

public senior secondary school students in Ibadan metropolis. It was concluded that classroom management indices are some of the causes of the academic achievement of students in Ibadan metropolis. It was recommended among others that teachers should be trained on classroom management skills especially on classroom control and time management.

Keywords: Home Educational Resources, Mathematics Achievement.

Word Count: 245

Introduction

Mathematics is the hub of all courses of study at the tertiary institutions which means that it is one of the major subjects right from the elementary to the higher level. Understanding mathematics gives a clearer picture and accuracy in the measurement of facts and for effective contributions both in business and other day to day activities of human endeavors. The word "Mathematics" is a Greek word, meaning things that are learned. It is defined as the science of counting, measuring and describing of the shape of objects. It deals with logical reasoning and quantitative calculations (Lee and H.Y.2018). Mathematics as a subject is recognized as the foundation of science and technology without which a nation is not likely to become prosperous and economically independent (Timmerman. VanLuit and S.W. 2017). This underscores the importance of mathematical competence of all the learners at every levels of education and a reason for making mathematics compulsory and one of the leading core subject in the secondary schools' curriculum.

Mathematics is one subject that is an integral part of everyone's life and affects virtually every field of human endeavor. An average man needs mathematics to survive no matter how rudimentary. There is no doubt the fact that an individual can get on sometimes without knowing how to read and write, but can never push on smoothly without knowing how to count, measure, add and subtract. The many uses and applications of mathematics in home, office, business, industries, agriculture, decision making and even in governance abound and are innumerable. For instance, it was said that in everywhere we go, everything we do or propose to do, either the structure of mathematics or its applications play a vital role and this is

why most countries, races and people put emphasis in all aspects of studying, developing and applying mathematics (Vencek, Kapur and Meltzoff 2015).

The world is speedily becoming a global village and that makes it even more imperative that all individuals have a better understanding and appreciation of mathematical procedures and methods of reasoning to be carried along (Tully and Jacobs 2010). Mathematics knowledge indeed equips individual with the skill to solve a wide range of practical tasks and problem that they may encounter in life. It is, thus, vitally important for both the nation and the individual that all students receive a quality mathematics education.

Since Mathematics is a very important subject as mentioned above, one will expect that a very high academic achievement will be observed among secondary school students. Unfortunately, this is not true in the case of Oyo State as not very high academic achievement in mathematics was reported among senior secondary school students who sat for Senior School Certificate Examinations (SSCE) organised by the West African Examinations Council. This is evident in the WAEC result statistics 2016-2018. The statistics revealed that in 2016, out of the 85,054 candidates that sat for SSCE in the State, 34,578 candidates passed at credit or above credit level. This means that 50, 476 students representing 59.34 percentage of the total number of all candidates that sat for the examination were not able to pass at credit level. In 2017, out of 65,152 candidates that sat for SSCE in the state, 36,808 were able to pass at credit or above level. This implies that 28,272 representing 43.4 percentage of the total number of candidates that sat for the examination were unable to pass at credit or above credit level. Also, in 2018, 74,386 candidates sat for the SSCE in the State, 40,839, this means that 33,547 representing 45.1 percentage of the candidates that sat for the examination were unable to pass at credit or above level (National Bureau of Statistics, 2016 to 2018).

The observed level of students' academic achievement of senior secondary school students in mathematics in Oyo State may be attributed to some inexhaustible factors including students related, parent related, as well as environmental related. Further to the foregoing, it appears that students' academic achievement in

mathematics is closely tied to Home Educational Resources (HER), hence, the need for this study.

The training and development of a child is naturally placed in the hands of the parents. This is congruent with the common assertion of sociologists that education can be an instrument of cultural change whose foundation begins from home (Ajala & Olutola. 2007). It is not out of place to imagine that home factors can have effect on academic achievement of children in schools, this is because anything that affects the developmental environment of children will possibly affect their education or disposition to education.

Home Educational Resources as a key component of home factors can be described as household educational materials which can facilitate learning. Specifically in this study, these are: studying facilities at home and personnel resources. Studying facilities include reading tables and chairs, reading room, educational games while personnel resource include home teacher, parent, siblings and other relations involved in teaching at home. Home Educational Resources not only lead to higher academic achievement, but to better attendance and improved behaviour at home as well as the school, the absence of which may likely make students achieve poorly in their academic pursuit. In view of this, this study aim at investigating the influence of Home Educational Resources on Senior Secondary School Students' Academic Achievement in Mathematics in Ibadan metropolis.

Statement of the Problem

Issue of students' academic achievement has over the years generated public concern. Academic Achievement of students in Mathematics which is one of the compulsory subjects has attracted special interest of stakeholders in education. This is not unconnected to the alarming rate at which students are failing mathematics in Nigerian secondary schools. For instance, it was observed that students' academic achievement in Mathematics is on the wane. Also, a review of students' performance in West African Mathematics examination revealed that over the past ten years, public secondary school students have not improved significantly in their level of achievement in mathematics. This has been a major theme of discussion in academic meetings over the years. Some factors identified as causes

include school, home and students' related factors. To this end, this study aimed at investigating the influence of home educational resources on students' academic achievement in Mathematics in Ibadan metropolis.

Aim and Objectives of the Study

The main aim of this study is to investigate the influence of home educational resources on Senior Secondary School students' academic achievement in Mathematics in Ibadan metropolis, Oyo State. Specifically, the study intends to achieve the following objectives:

1. Investigate the effect of home educational resources on senior secondary school students' academic achievement in mathematics in Ibadan metropolis.
2. Determine level of academic achievement of senior secondary school students in Mathematics in Ibadan metropolis.

Hypotheses

For the purpose of this study, the following null hypotheses were tested:

$H_0$1: There will be no significant effect of home educational resources (study facilities at home and personnel resources) on senior secondary school students' academic achievement in Mathematics in Ibadan metropolis.

$H_0$2: There will be no significant school type difference in level of senior secondary school students' academic achievement in Mathematics in Ibadan metropolis.

Significance of the Study

If the findings of the study is considered or implemented, it will be of immense benefits to all stakeholders in education especially at the senior secondary school level which is the major focus of this study.

The study will identify various home educational resources available in homes of senior secondary school students with the aim of exposing the parents to the importance of providing home educational resources for their children at home and consequently, the implications on their academic achievement will be clearly unveiled.

Government will also benefit from the findings of this study as the need to formulate policies that will facilitate or enforce the use of state resources in the right way for the citizen to enjoy good facilities to enhance the educational system at home.

The society at large will know through the findings of this study, the level of academic achievement of students in mathematics over the years. Also, the findings of the study will inform the society on how they can be of help to salvage the perceived poor achievement of students in senior secondary schools.

Senior secondary school students will also benefit from the findings of this study as ways to improve their academic achievement in mathematics using home educational resources will be sufficiently discussed.

Scope of the Study

The study examined the effect of home educational resources on senior secondary school students' academic achievement in Ibadan metropolis. The conceptual scope of the study was delimited to home educational resources as measured by the following indices: (studying facilities at home, length of study time at home and personnel resources at home). Also, the geographical scope of the study was limited to senior secondary schools in Ibadan metropolis.

Research Design

This study adopted descriptive survey research design to determine the extent to which home educational resources (studying facilities at home, length of study time at home and personnel resources at home) influence senior secondary school students' academic achievement in mathematics in Ibadan metropolis.

Sample and Sampling Techniques

Multistage sampling procedure were used to get an unbiased sample for the study for a true representation of the entire population. At the first stage, the population was stratified into eleven based on the available local governments in the study population. These are Ibadan north, Ibadan northeast, Ibadan northwest, Ibadan southeast, Ibadan southwest, Akinyele, Egbeda, Ido, Lagelu, Oluyole and Ona-ara. At the

second stage, simple random sampling technique was used to select two private and two public senior secondary schools respectively from Ibadan metropolis to give a total of forty-four (44) sampled schools. Lastly, the researcher engaged all senior secondary school two students available (647) during the cause of instrument distribution in their respective schools and 568 students responded adequately while 79 students' responses were inadequate. Also, using simple random sampling technique, the study also select out forty-four teachers from the total population of the study to respond to the teacher questionnaire.

Research Instrument

Two instruments were used for the purpose of collecting data to achieve the stated objectives of the study. These are self-developed instruments on Home Educational Resources (HERQ) and adopted Students Mathematics Achievement Test (SMAT).

The instruments were carefully structured to capture the variables under study and sufficiently developed to contain items good enough to achieve stated objectives. HERQ were divided into two sections, A and B. Section A catered for students demographic characteristics such as gender, age, school type, father and mother's qualifications and types of occupations. Section B was structured to investigate the extent to which students agree with their Home Educational Resources vis a viz. (studying facilities at home, length of study time at home and personnel resources at home). The second instrument SMAT contained thirty (30) structured objective mathematics questions carefully adopted from approved syllabus for Nigerian senior secondary schools.

Reliability of the Research Instrument

Reliability concerns itself with the degree to which a measuring procedure or instrument gives similar results over a number of repeated trials. In order to measure the degree to which this research instruments will yield consistent results, a pilot test was carried out by administering a sample of the instruments to twenty (20) students from two senior secondary school students in Ibadan metropolis. Cronbach alpha method were used to find out the

reliability of the instruments while Kuder-Richardson (KR_{20}) were used to determine the reliability of the Mathematics Achievement Test. Home Educational Resources Questionnaire (HERQ) yielded 0.842 and Mathematics Achievement Test (MAT) yielded 0.724 respectively.

Hypothesis One: There will be no significant combined influence of home educational resources (study facilities at home, length of study time at home and personnel resources) on senior secondary school students' academic achievement in mathematics in Ibadan metropolis, Oyo State.

Table 1: Estimate of the Composite Contribution of Home Educational Resources on Students' Academic Achievement in Mathematics

ANOVA					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Regression	9.618	2	4.809	0.216	0.806
Residual	12540.382	564	22.235		
Total	**12550.000**	**566**			

Table 1 shows that multiple regression correlation coefficient indicating the relationship between the predictor variables (Home Educational Resources) and Students' Academic Achievement was 0.028. The adjusted R squared is 0.003, this means that the predictor variables (Home Educational Resources) when put together accounted for 0.3% variation in the Students' Academic Achievement. This indicates that there is a weak link of relationship between the variables. This was further corroborated using multiple regression ANOVA $F_{(2,564)} = 0.216$; $p > 0.05$. This implies that with the availability and usage of home educational resources does not necessarily predict students' academic achievement in Mathematics. This might be attributed to their inability to use it appropriately, though available.

Hypothesis Two: There will be no significant relative influence of home educational resources (study facilities at home, length of study time at home and personnel resources at home) on senior secondary school students' academic achievement in mathematics in Ibadan metropolis, Oyo State.

Table 2: Estimate of the Relative Contribution of Home Educational Resources on Students' Academic Achievement in Mathematics.

Independent Variables (Predictors)	Unstandardized Coefficients	Unstandardized Coefficients				
	B	Standard error	Beta	Rank	t	Sig.
Study Facilities at Home	0.000	0.182	0.000	3rd	-0.001	0.999
Length of Study Time at Home	-0.202	0.112	-0.105	5th	-1.810	0.071
Personnel Resources at Home	0.131	0.053	0.112	1st	2.463	0.014
Constant	12.728	0.692			18.384	0.000

*sig. at $p<0.05$

Table 2 shows the relative contribution of each of the predictor variable to students' academic achievement in mathematics. Personnel resources at home (B=0.112), study facilities at home (B=0.000) and length of study time at home (B= -0.105). Parental involvement is associated with children's higher achievements in language and mathematics, enrolment in more challenging programs, greater academic persistence, better behavior, better social skills and adaptation to school, better attendance and lower drop-out rates[133]. Their involvement has positive impact on children academic

achievement even when the background factor such as social class, family size, has been taken into account[134].

Hypothesis Three: There will be no significant school type difference in level of senior secondary school students' academic achievement in mathematics in Ibadan metropolis, Oyo State.

Table 3: Independent sample t test showing difference in school type on academic achievement in mathematics.

School Type	N	Mean	SD	SEM	t	df	P	Decision
Private	187	13.48	5.198	0.380	3.126	320.379	0.002	Reject
Public	380	12.09	4.394	0.225				

Significant: ρ > .05

Table 6 results show that there is a significant mean difference in the mathematics academic achievement of students from private and public senior secondary schools **[t (320.379) = 3.126, p 0.002 <0.05].** This is because the calculated significance (.002) is lesser than the critical alpha level of significance (0.05). This result also gives the mean value of the academic achievement of senior students in private and public secondary schools. The result shows that students in private schools have higher achievement in mathematics (mean value of 13.48) than their counterparts in public schools (mean value of 12.09). The null hypothesis, by implication, is hereby rejected. This might be due to high level of monitoring of both teachers and students in private schools.

Conclusion

- Lack of Home educational resources at home is a major factor causing poor academic achievement of secondary school students in Ibadan metropolis.
- Secondary school students in Ibadan metropolis performed averagely low in external examinations especially in mathematics.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Parents should be encouraged to not only provide educational resources at home but should also ensure it usage by the children.
2. All hand should be on deck to ensure improvement of secondary school students' academic achievement especially in mathematics.

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