The Effectiveness of Home Assignment on the Academic Performance of Secondary School Students in Mathematics in Ado- Ekiti LGA of Ekiti State, Nigeria

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ABSTRACT: *The study investigates the effectiveness of home assignment on the academic performance of secondary school students in mathematics in Ado-Ekiti LGA of Ekiti State, Nigeria. One hundred and ninety-five (195) students and twenty (20) teachers were randomly selected from ten (10) senior secondary schools in Ado Local Government Area of Ekiti State which comprise of four (4) private schools and six (6) public schools. A general question was formulated and answered descriptively, while the three hypotheses formulated for the study were tested using ANCOVA statistic. The result shows that there is no significant difference in the performance of the high achievers in the three groups before and after giving of home assignment. Also, significant difference does not exist in the performance of the average achievers in the three groups before and after giving of home assignment. Lastly, no significant difference exists in the performance of the low achievers in the three groups before and after giving of home assignment at p<0.05. It is recommended that teachers should not attach too much importance to home assignment scores or grades but rather motivate the students to do their home assignment by making them realize the benefits they will derive from attempting it.*

Key Words: *Mathematics; Homework assignment; Teachers; Mathematics Achievement Test; Secondary schools*

Introduction

Mathematics has been the bedrock of the world's innovations from time immemorial. It is the substratum on which the technological advancement of today was built. Being the corner stone of the scientific and technological development, mathematics is undoubtedly one area in the school curriculum that generality of students dread greatly [15].

Mathematics as a subject is so indispensable to national goals and objectives that it was made compulsory for every student in both primary and secondary school. A credit pass at it was made a prerequisite to study any course in higher institutions. This great emphasis was placed upon the learning of mathematics because of its utility to the individuals and as well as to the nation at large. Mathematics is a subject that cut across all the sciences. Therefore, in our quest for scientific and technological advancement, we need nothing short of good performance in mathematics at all levels of schooling. Mathematics has been found useful in all human endeavours and it holds the key to the study of other science subjects. Undoubtedly, the development of any nation in the fields of science and technology depends heavily on the knowledge of mathematics acquired by her citizens.

However, in spite of the enviable position occupied by mathematics, students continue to dread and fail the subject woefully in the WAEC examination.

Performance of students in mathematics at the end of secondary school education has not improved in the past decade [16,18]. [3]observed that the performance of secondary school students in mathematics is still very unfortunate. This has caused a lot of concern to government, parents and even the students themselves. For instance, table 1 below shows the trend of students' performance in SSCE General Mathematics for a period of ten (10) years successively.

Table 1: Trends of students' performance in SSCE General Mathematics (May/June 2003-2012).

Year	No. of candidates that sat for the exams	No. of candidates that passed at credit and above (A1 – C6)	No. of candidates with ordinary passes (D7 – E8) and F9
2003	926,212	341,928 (36.35%)	584,284 (63.09%)
2004	832,689	287,484 (34.52%)	545,205 (65.04%)
2005	1,054,853	402,982 (38.20%)	651,871 (61.80%)
2006	1,149,277	472,674 (41.12%)	676,603(58.88%)

2007	1,249,028	584,024 (46.75%)	665,004 (53.25%)
2008	1,268,213	726,398 (57.28%)	541,815 (42.72%)
2009	1,348,528	634,382 (47.04%)	714,146 (52.96%)
2010	1,306,535	548,065 (41.95%)	758,470 (58.05%)
2011	1,508,965	608,866 (40.35%)	900,099 (59.65%)
2012	1,658,357	838,879(50.58%)	819,478 (49.42%)

Source: Statistics Division, WAEC Office, Yaba, Lagos, Nigeria. (2014).

Available statistics from table 1 shows that the percentage of students who passed mathematics at credit level and above was below 50% between 2002 - 2007. The performance improved slightly in 2008 to 57.28% but dropped successively from 2009 to 2011 and slightly increases in 2012. It has been observed that mathematics is most neglected by the secondary school students in spite of its compulsory status and student's performance in it is of great concern. This poor performance in mathematics has become a matter of grave concern to generality. This concern is justified because of the fact that mathematics occupies a center figure in the pursuit of science, commerce and the management of the economy.

One of the factors that could stimulate students' interest in mathematics in secondary school is take home assignment. Home assignment according to [6], is the participation of students in learning activities outsidethe classroom teaching – learning environment.Home assignment and studying serve an important purpose in enhancing good performance of students in mathematics. Home assignment is not just a work assigned to students to keep them occupied at home; rather, it serves several educational purposes that are essential to receiving a complete education and improve students' performance in their academics. It provide an ample opportunity for students to develop self-discipline, study habit and time management. Students can set home work goals and enjoys a feeling of accomplishment when the goals are met. Home assignment helps students to learn how to be independent and responsible.

Home assignment also closes the gap between school and home as it could serve as an extension of class activities while students are away at home. It can be in the form of preparation of assignments to prepare students ready for class activities or projects that have to be worked on in parallel with school work [7].

[14]carried out a study to determine students' grasp of the problems and exercise assigned to them by giving quiz which were taking from exercises assigned for home assignment. It was discovered that the study has influence on the students and they seemed to grasp the idea that it was imprudent to depend on someone else for their daily work. [5,9] concluded in his study that home assignment and school work should not be separated in learning activities and that home assignment is a creative work rather than practice. It places the students in the position of a chosen contributor, a responsible member of the group. This makes the students become a necessary part of the total organization.

A lot of research work has gone into the theory and psychology of learning mathematics and many literatures exist on this. The theoretical literature predicts a positive impact of homework time on academic achievement [4,11].Also, [15,7,14] documented their studies on the impact of homework time on the performance of college students. Learning models and theories have been proposed. And again, much controversy has been arising on what mathematics is to teach and how to teach it effectively to a majority of Nigerian students. As a result of having gone through mathematics curriculum, one observed that including home assignment to the work of students will bring about the desired effectiveness of the subject. Therefore, this research work investigates the impact of home assignment on the academic performance of students in mathematics.

Statement of the Problem

In spite of all the available qualified and trained teachers as well as multiple examinations at the disposal of secondary schools students, most of the students were unable to secure admission into tertiary institutions due to their inabilities to pass mathematics at credit level.

The following general question arises from this statement of the problem.

What is the general view of teachers on the impact of home assignment on academic achievement of students in mathematics?

Purpose of the Study

The study sets out clearly to investigate the effectiveness of home assignment on the academic performance of secondary school students in mathematics in Ado Local Government Area ofEkiti State, Nigeria.Specifically, the study set to:

- Evaluate students' academic performance through series of assignments

- Evaluate teacher's effectiveness in marking and correcting home assignments and its attendant effects on student's academic performance
- Evaluate gender difference in students' performance in home assignment

Research Questions

From the purpose of the study stated above, the following three research questions were generated for the study.

1. Will giving home assignment to students improve their achievement in mathematics?
2. Will marking and corrections of home assignment improve students' achievement in mathematics better than giving home assignment without giving corrections?
3. Will there be any difference in the performance of male and female students who were given home assignment in mathematics?

Hypotheses

Based on the research questions above, the following three hypotheses were formulated to guide the study.

Ho_1: There is no significant difference in the performance of the high achievers in the three groups before and after giving of home assignment.

Ho_2: There is no significant difference in the performance of the average achievers in the three groups before and after giving of home assignment.

Ho_3: There is no significant difference in the performance of the low achievers in the three groups before and after giving of home assignment.

Methodology

The study is descriptive research of survey type which involves sternly the comparative analysis of students' performance based on the home assignment given to the students. It is survey type which aimed at collecting data on and describing in a systematic manner the characteristics, features or facts about a given population [1,2].

The target population for the study consisted of all private and public secondary schools in Ado Local Government Area of Ekiti State. The number of schools was twenty seven all together which involve twelve private schools and fifteen public secondary schools.

Sample and Sampling Techniques

A sample of one hundred and ninety-five (195) students was randomly selected from ten (10) secondary schools senior class one (SSS1) and 20 teachers for the study. The ten schools were purposively selected from the sixteen secondary schools.

Instrumentation

The instruments used for the study were achievement pre-test and post-test together with questionnaire to obtain information on mathematics teacher's opinion on giving home assignment. The raw scores of the mathematics achievement test were collected for data analysis, students' scores were selected and their mean scores were calculated. The face and content validities were ascertained by three Lecturers from Mathematics departments, College of Education, Ikere-Ekiti and it was re-presented to two test and measurement experts from the Institute of Education, EkitiState University, Ado-Ekiti. While the construct validity and reliability was determined by the researcher using alpha Cronbach, the result of the estimate was 0.78 and this index is considered high and significant enough for this kind of study and it corroborate with the [11,4] who argued that reliability coefficient of any instrument should range between 0.50 – 0.85 and above. With the assistance of the various Mathematics teachers whose classes were used for the study mostly from ten sampled schools, the solved pre-test and post-test question papers together with the completed questionnaire were collected from the respondents and coded and analyzed accordingly with the aid of computer assistance. There was no report of any loss of question papers or questionnaire. With this, 100% return rate was achieved.

Data Analysis

The data collected from the questionnaire were analyzed descriptively to answer the general question while analysis of covariance (ANCOVA) was used to test the three hypotheses formulated at 0.05 level of significance using SPSS version 20.

Results and Discussion

This section explains the descriptive analysis and the hypotheses using percentages and analysis of covariance (ANCOVA). While percentages proffer answers to the items of the questionnaires given to the

respondents in the field,analysis of covariance (ANCOVA) statistic was used to test the three hypotheses formulated at $p < 0.05$.

General Question

What is the general view of teachers on the impact of home assignment on academic achievement of students in mathematics?

Table 1: Showing the general view of teachers towards home assignment.

S/N	ITEMS	SA	A	D	SD	REMARKS
1.	Home assignment help to monitor or measure the improvement of students in mathematics	2 (10%)	15 (75%)	3 (15%)	0 (0%)	A
2.	Home assignment do not help students to develop confidence in themselves in mathematics	3 (15%)	0 (0%)	15 (75%)	2 (10%)	D
3.	Home assignment mean much only to the students who are of average or below average in their performances in mathematics	3 (15%)	0 (0%)	15 (75%)	2 (10%)	D
4.	Home assignment makes students work at a faster rate most especially in mathematics	2 (10%)	15 (75%)	0 (0%)	3 (15%)	A
5.	Home assignments motivate or reinforce students to practice constantly and promptly the concept learnt.	1 (5%)	16 (80%)	0 (0%)	3 (15%)	A
6.	Frequent home assignment improves students' score in their examination	15 (75%)	4 (20%)	0 (0%)	1 (5%)	SA
7.	Home assignment provides experience in problem solving	4 (20%)	15 (75%)	1 (5%)	0 (0%)	A
8.	It is advisable to give home assignment always even if it is not marked than not given it at all	4 (20%)	15 (75%)	1 (5%)	0 (0%)	A
9.	Home assignment do not help students to apply concept learnt	1 (5%)	3 (15%)	1 (5%)	15 (75%)	SD
10.	Giving home assignment to mathematics' students is a good idea	15 (75%)	1 (5%)	1 (5%)	3 (15%)	SA

The table 1 above revealed that the respondents indicated Strongly Agreed to items 6 and 10, and Agreed to items 1,4,5,7 and 8 while the respondents opinion was based on Strongly Disagreed to item 9 and Disagreed to items 2 and 3.

Students are grouped as high ability, average ability and low ability students. Those that scored between 0 – 9 are grouped as low ability while those that scored between 10 – 14 and 15+ are grouped as average ability and high ability respectively. The frequency distribution is shown below:

Table 2: Frequency distribution of the pre-test score of the students from the three groups

Description	Score range	Group 1	Group 2	Group 3	Total
High ability students	15+	8	14	16	38
Average ability students	10 – 14	39	33	34	106
Low ability students	0 – 9	18	18	15	51
Total		65	65	65	195

Table 2 above specified the frequency distribution of the pre-test score for each of the groups.

Table 3: Mean and standard deviation of students' scores in the pre-test and post-test for all the groups.

		PRE-TEST		POST-TEST	
	Group	Mean	Standard Deviation	Mean	Standard Deviation
High ability students	I	18.00	3.70	15.63	3.31
	II	17.57	1.24	19.71	3.9
	III	20.56	6.46	16.19	4.61
Average ability students	I	11.39	1.10	13.56	2.90
	II	12.35	1.20	13.61	2.84
	III	12.29	1.14	14.82	4.78
Low ability students	I	7.39	1.30	12.83	3.19

	II	7.22	1.55	13.67	4.53
	III	8.33	0.80	14.94	5.16

Table 3 above showed the summary of the mean and standard deviation of the students scores in the pre-test and post-test given to all the groups.

Hypotheses Testing

Ho_1: There is no significant difference in the performance of the high achievers in the three groups before and after giving of home assignment.

Table 4: The ANCOVA analysis for the high ability students in the groups

Source of Variation	df	SSX	SSY	SXY	Adjusted			$F_{(cal)}$	$F_{(tab)}$
					SSY	df	MSS		
Group treatment	2	75.37	123.67	62.23	191.23	2	59.62	3.11	34.05
Error	35	815.37	651.17	0.40	651.17	34	14.16		
Total	37	890.74	774.84	62.63	842.40	36			

From table 4 above, the F – statistic analysis show that $f_{(cal)}(3.11)$ is less than $f_{(tab)}(34.05)$ at $p<0.05$ level of significance. This shows that there is no significant difference in the performance of the high achievers in the three groups before and after giving of home assignment hence the null hypothesis was upheld.

Ho_2: There is no significant difference in the performance of the average achievers in the three groups before and after giving of home assignment.

Table 5: The ANCOVA analysis for the average ability students in the groups

Source of Variation	df	SSX	SSY	SXY	Adjusted			$F_{(cal)}$	$F_{(tab)}$
					SSY	df	MSS		
Group treatment	2	22.04	47.01	19.33	31.23	2	15.61	0.74	34.05
Error	103	163.93	2282.38	103.52	2167.01	102	21.25		
Total	105	185.97	2329.39	122.85	2198.24	104			

From table 5, the F – statistic analysis show that $f_{(cal)}(0.74)$ is less than $f_{(tab)}(34.05)$ at $p<0.05$ level of significance. This shows thatthere is no significant difference in the performance of the average achievers in the three groups before and after giving of home assignment hence the null hypothesis was upheld.

Ho_3: There is no significant difference in the performance of the low achievers in the three groups before and after giving of home assignment.

Table 6: The ANCOVA analysis for the low ability students in the groups

Source of Variation	df	SSX	SSY	SXY	Adjusted			$F_{(cal)}$	$F_{(tab)}$
					SSY	df	MSS		
Group treatment	2	11.44	36.25	17.07	38.19	2	19.09	0.95	34.05
Error	48	82.72	951.44	13.17	949.34	47	20.20		
Total	50	94.16	987.69	30.24	987.53	49	39.29		

From table 6, the F – statistic analysis show that $f_{(cal)}(0.95)$ is less than $f_{(tab)}(34.05)$ at $p<0.05$ level of significance. This shows thatthere is no significant difference in the performance of the low achievers in the three groups before and after giving of home assignment hence the null hypothesis was upheld.

Discussion of Findings

The following were found from the descriptive analysis from table 1, most of the respondents showed Agreed (A) with 75% in item 1, 75% in item 4, 80% in item 5, 75% in item 7 and 75% in item 8, indicating that most of the teachers believed that home assignment helps in measuring the improvement of students in mathematics and that it makes students work at a faster rate, it also show that home assignment motivate students to practice the concept learnt frequently and that it gives them experience on problem solving.

The study revealed that, at $p<0.05$, there was no significant difference in the performance of the high achievers, average achievers and low achievers in the three groups before and after giving of home assignment. The studies of [7,10,12,13] all posited that home assignment contributes to students' improvement in mathematics. This study supports the research findings of [8,9,12,17] which asserts that

constant home assignment does have significant effect on the performance of students in mathematics. This may be as a result of the performance of students in the assigned home assignment or the way the lessons were taught by the teachers before giving the home assignment or the way they are administered by the teachers or other inherent reasons during the study.

Recommendations

Based on the findings of the study, there is need for oral quiz on the given home assignment in class after submission; this will help the teacher to determine the level of understanding of the problem by the students.

Teacher should not attach too much importance to home assignment scores or grades but rather motivate the students to do their home assignment by making them realize the benefits they will derive from attempting it.

Fair attempt should be stressed instead of getting the problem right. Teacher need not to grade every home assignment but at least, do the grading and recording of the grades intermittently and may sometimes look at a small sample of students' home assignment.

Class correction should involve much of the students' participation instead of mere copying.

Lastly, teachers should endeavour to give different home assignment to different ability groups and involve the students in marking and grading their assignment occasionally.

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