CONTEMPORARY ISSUES IN CURRICULUM AND EVALUATION RESEARCH



Edited by: Folajogun V. Falaye Joseph A. Adegbile Adams O. U. Onuka

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INFLUENCE OF HOMEWORK ON STUDENTS' ACHIEVEMENT IN JUNIOR SECONDARY SCHOOL MATHEMATICS IN OGUN STATE

J. Gbenga Adewale

Introduction

One of the strongest predictors of students' achievement is homework (Farombi 1998). Homework is the set of tasks given by teachers for students to complete at home either to reinforce students' knowledge on the topics already covered or to explore new concepts which could serve as teasers and it is capable of helping students discover knew knowledge and could be useful in a new learning situation. However, many parents have different perceptions on homework Majority of the parents feel that their children are assigned the right amount of homework, some feel that the homework given to students is below their capability while others feel that students are labouring under the heavy load of homework. Cooper (2006) indicates that about 57 percent of parents felt their children were assigned about the right amount of homework; 23 percent thought it was too little while 19 percent thought it was too much. He further states that advocates of homework argue that it can have many other beneficial effects. For example, it can help students develop good study habits so they are ready to grow as their cognitive capacities mature. It can help students recognize that learning can occur at home as well as at school. Homework can foster independent learning and responsible character traits. And it can give parents an opportunity to see what is going on at school and let them express positive attitudes toward achievement.

As a parent, the investigator swings between the three points of view; at a time, he feels that the homework is not enough, at another, he feels that the frequency of homework is in the right proportion; yet at another time he feels that the frequency of homework is worrisome especially when the children have to sit up from say 6 of clock in the evening doing various homeworks till 12 midnight almost on a daily basis. Meanwhile, studies have suggested that average students take more time to complete homework assignments simply because these assignments are more difficult for them (Cooper 2006). It is also bothersome, when students are

in their continuous assessment week (this is the week devoted for all sorts of tests in virtually all school work) and they are still saddled with the trouble of doing homework. At such times, parents have complained that their children should be excused from doing homework during tests period. Another irritating situation is when a teacher uses homework as a learning situation for him/herself, at this stage, the homework is no longer for the students but parents. For example, a child in Primary 2 was asked to write about medieval age, the growth of information in the Stone Age to the industrial age. One begins to wonder if the teacher is not the owner of the homework from his or her lecturer in the College or University which he/she wants the parents to solve for him/her. These are some of the reasons why some opponents of homework counter that it can have negative effects. They argue that it can lead to boredom with schoolwork, since all activities remain interesting only for so long. Homework can deny students access to leisure activities that also teach important life skills. Parents can get too involved in homework thereby confusing their children as when they use different instructional techniques which the teacher has not exposed the students to.

As a parent, after the children have devoted a lot of time to completing their homework, children are often asked what they scored in their homework, sometimes there are shocking remarks by the children that the teacher did not even ask for the homework. This is a high level of students' abuse; if you are not interested in assessing students' homework, why call it homework and not practice questions. The situation is not limited to Nigeria; in the study by Adewale (2009) in Sao Tome and Principe on Monitoring Learning Achievement (MLA), he finds that while few pupils indicated that their numeracy homeworks were never monitored, many pupils indicated that their literacy was not monitored at all. Teachers give homework but the homework was never checked all the time. However, more of these pupils indicated that family members monitored their homework in literacy.

As good as parents' perceptions about the frequency and length of homework could be, it cannot provide such information as whether homework influences students' achievement or not; that is why this study is conducted. The research is carried out by comparing two groups of students who are similar in other ways. These are students who completed their homework and students who did not complete their homework. This seems to be a faulty design because many reasons could be responsible for student's failure to complete their homework. Some of the reasons could be that the students do not have sufficient understanding on how to carry out the homework because they do not receive any form of assistance in terms of instructional materials (textbooks, mathematical set, etc.) or parental assistance. Another reason could be that the students are intelligent but have poor attitude (laziness) to completing homework unless forced by teachers or the parents. A good design would have been a situation where a set of students are assigned homework and another set of students with the same characteristics and conditions are not assigned homework. For this condition to be perfect, a single term cannot be used to determine whether completing homework by students has effect on their achievement or not. This situation is not encouraged in a normal Nigerian classroom setting driven by the National Policy on Education which prescribed a continuous assessment and school examinations to be in a ratio of 40:60. This ratio is to be used as basis for advancement from one class to another in both the public and private schools (FRN 2004).

One of the measures of continuous assessment is the homework; hence it would be difficult to isolate some students from homework design and incorporate some students into homework design. Therefore, in this study, the achievement of those who completed their homework was compared with those who did not complete their homework in junior secondary school mathematics. The study isolated those who did not complete their homework and examined why such students did not complete their homework. It is possible for some of them to complete the homework but could not submit for assessment, but this study was limited to the first two challenges (incomplete) or undone homework). Parents who feel the nagging experience of homework were asked to suggest the frequency and duration of homework allowed for students in the junior secondary school. Their suggestion was used as a threshold period for students' upper limit for homework in mathematics.

Statement of Problem

Many parents consider that the amount of homework in school is below expectation while others see homework as a burden more so that it cannot be concluded if homework influences students' achievement. Therefore, this study sought to isolate those junior secondary school students who did their homework from those who did not; compared their achievement in mathematics and explained why some of the students did not do their homework. The study also provides information on the threshold time for homework in junior secondary school mathematics.

Research Questions

- (1) How frequently do students complete junior secondary school mathematics homework in a week?
- (2) Is there a significant difference in the achievement of students who completed their homework and those who did not in junior secondary school mathematics?
- (3) What are the constrained faced by students who do not complete their homework?
- (4) What is the frequency of homework and the amount of time needed for homework?

Methodology

Sample and Sampling Technique

This is a survey which used a target population of all mathematics students in junior secondary schools 2 (JS 2) in Ogun State. Purposive sampling technique was used to select (as much as possible) homogeneous samples. The following were the criteria set:

- (i) mathematics is taught every day and
- (ii) students with possession of the same recommended mathematics textbook were used from public schools (no private school was used).

The study adopted a multistage stratified random sampling technique for the samples that survived the criteria earlier stated. The sampling was at four levels: the senatorial districts level; the local government areas (LGAs); school and subject levels. Stratified random sampling technique was extensively used in selecting samples for the study. This sampling technique was used because stratification increases the reliability of survey estimates; improves efficiency of the sampling technique; allows the use of different sampling techniques for a single study; and ensures adequate representation of specific groups in a target population.

As at the time of this study, there were 20 LGAs in Ogun State, divided into three senatorial districts. From each district, two LGAs were randomly selected. In all, a total of six LGAs participated in the study. Sampling at school level was done by collecting a list of all secondary schools by ownership status (public only) and location (urban or rural) from the Ogun State Ministry of Education. Four schools were randomly selected in each LGAs. Sampling at participant level (students) was done using simple random sampling technique to select twenty (20) students at JS2 level. In all, 480 JSS 2 students in 24 schools participated in the study. The parents of the 480 students were also used in the study.

Instrumentation

Three instruments were used in the study, these are:

- (i) Mathematics achievement test
- (ii) Student questionnaire and
- (iii) Parent questionnaire

Mathematics Achievement Test

This is a forty-item test with four-option format namely, A, B, C and D, administered at the end of 3rd term. The items used in the test were developed from the JSS 2mathematics syllabus (curriculum-referenced) to ensure good content coverage. Students were expected to select the option that best expressed their knowledge. Distribution of items by content and cognitive behaviours is presented in table 1. The first three levels of cognitive operation (knowledge, comprehension and application) were used in this study. Since the students were in JSS 2 and were getting ready for their promotion examination, it was expected that they would have covered the syllabus and that was why the test items examined all the branches of mathematics. Mathematics curriculum is structured along six themes: Number and Numeration, Basic Operation, Algebraic Process, Geometry, Mensuration and Statistics.

and a star of the	Knowledge (44%)	Understanding (33%)	Thinking (23%)	Total
Number and Numeration (25%)	4	3	3	10
Basic Operation (24%)	4	3	2	9
Algebraic Process (5%)	1	1	0	2
Geometry (13%)	2	2	1	5
Mensuration (24%)	4	3	3	10
Statistics (9%)	2	1	1	4
Total	17	13	10	40

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An initial pool of 100 items was trial-tested on a similar group of students in a LGA not selected for field work. Comments from the trial testing exercise were used to enrich the test. Item analysis was carried out and the items in the test with facility indices ranging from 0.2 to 0.6 as suggested by Thorndike (1997) were retained, and those outside this

criterion were discarded. Forty five items fell into the criterion set but some of them have structural problems and the 45 items were pruned to 40 as shown in table 1. The 40 items discriminated between strong and weak students. A K-R 20 (a measure of internal consistency and construct validity, Thorndike (1997)) of 0.82 was obtained. The reliability value is high, thus the instrument was used for the study.

Student Questionnaire

The student questionnaire was designed to gather relevant information on the homework related variables. For example, number of times students complete homework in mathematics. The response format—not at all, once a week, twice a week between and 4 times and every day. It also contained a list of some of the constraints that made student not complete their homework like helping parents in their work, household chores after school (cleaning, fetching water/firewood, baby-sitting, etc), watching TV/Video/computer game, playing with friends, selling/hawking after school. They were expected to respond on a 2-point scale (yes or no). The questionnaire was given to colleagues in the Institute of Education, University of Ibadan, Nigeria for content validity. However, the questionnaire was administered to a representative sample of students in another LGA, a Cronbach alpha of 0.87 was established. This value is judged high to warrant the use of the instrument in this study.

Parent Questionnaire

The questionnaire was divided into two sections, A and B. Section A dealt with such variables as sex, education qualification, school child or ward attendants. Section B dealt with number of homework children in junior secondary school bring home in mathematics, the amount of time children spend on the homework and recommended time children should use in completing homework. In section A, parents are to select the correct option for a list of alternatives. However, in section B, the response format is not to select but supply. Parents are to supply answers to the questions. The content validity of the instrument was established by colleagues in the Institute of Education, University of Ibadan, Nigeria.

Administration, Collection of Data and Data Analysis

Guidelines for the conduct of the exercise were produced and distributed to all the field officers to ensure uniformity of administration during the training of field officers. Mathematics achievement test and student questionnaire were administered on the students. The students were asked

to take the parent questionnaire home to be completed by their parents. They were also informed to return the completed questionnaire from the parent to the school the following day. The research assistants went back to the school the following day to collect the parent questionnaire. Not all the students returned the parent questionnaire; however, a larger proportion of the students (69%) returned the parent questionnaire. The SPSS software was used to analyze the data. Such statistical procedures like frequency count, percentage and t-test were employed in the study.

Results and Discussion *Research Question One*

How frequently do students complete junior secondary school mathematics homework in a week?

For the purpose of this result, those students who completed their homework at least 2 times out of five times a week are categorized as completed but students who completed one or did not complete at all are categorized as not completed

er of the local dis		F •	%
No response	61	12.7	
Not at all	97	20.2	- 14 C
Once a week	83	17.3	
2 times a week	24	5.0	
3 times a week	33	6.9	
4 times a week	31	6.5	
Everyday	151	31.5	
Total	480	100.0	

Table 2: Frequency of homework per week

A large proportion of the students (12.7%) did not respond to the question item that had to do with frequency of homework. There is a bulge at each of the two extremes of the response format: a large proportion (about one-fifth) of students did not complete their homework at all and majority of the students (31.5%) completed their homework every day. It is amazing to note that, those who did not complete their homework were on the high side. The reason could be that their teachers may not have given them homework but this assumption is hard to believe because mathematics is a subject offered every day and there are always a lot of

problems to be solved and at the same time practising mathematical problems promotes students' learning achievement. Few students indicated that they completed their homework between 2 and 4 times a week as presented in figure 1.



Fig. 1: Percentage of frequency of completion of homework

The results in table 2 can be categorized into two: those who completed their homework; those who did not. Those who completed homework were more (239 = 49.9%) than those who did not (180 = 37.5%) as presented in figure 2.



Fig. 2: Percentages of those who completed and those who did not complete their homework

It is important to note that it is not a guarantee that those who do the homework are good in the class. However, one can reason that if students are given "reasonable" homework everyday (not the ones that will take almost 7 hours a day) and there is functional mechanism to check those who default and are provided with corrective discipline, it is likely that students will do their homework. Again, for those who were conscientious at doing homework, there is the likelihood that their achievement will be high. This is because, there are research evidences that frequency of assignments and homework is directly proportional to students' achievement (NAEP 2006).

Research Question Two

Is there a significant difference in the achievement of students who completed their homework and those who did not in junior secondary school mathematics?

T-test comparison analysis was employed to determine the differences in the achievement of students who completed their homework and those who did not.

Table 3: T-test Analysis of Students who completed their Homework and those who did not

Source of variation	N	Mean	SD	df	t-value	Sig.
Completed	239	29.08	4.54	417	5.66	0.000
Not complete	180	24.61	5.28	1		

Students who completed their homework performed better (M = 29.08; SD = 4.54) than those who did not (M = 24.61; SD = 5.28). Practising homework helps students to gain from supplementary materials like the internet, parent, older siblings and other educational materials at home. Again, study-habit of the students is likely to improve which has been considered a good predictor of students' achievement. The study of Cooper (2006), Bennett and Kalish (2006) and Eren and Henderson (2006) showed a positive link between homework and achievement. He also found that practising homework does improve scores on class tests at all grade levels. Although, the findings of this study did not reflect the link between the quantity of time spent on homework and the students' achievement, it is imperative to note that a little amount of homework may help elementary school students build study habits. Homework for junior high school students appears to reach the point of diminishing returns after about 90 minutes a night according to Cooper (2006). For high school

students, the positive line continues to climb until between 90 minutes and 150 minutes of homework a night, after which returns diminish.

Research Question Three

What are the constraint faced by students who do not complete their homework?

One hundred and eighty students were grouped as not completing their homework. One may wonder why they are in this category; the research question addressed the concern. Frequency and percentage of different reasons why students did not complete their homework are presented in table 4.

	F	%
(a) I help my father/mother in his/her work	46	25.7
(b) I do house work after school (cleaning, fetching water/firewood, baby-sitting, etc)	43	23.7
(c) I watch TV/Video/computer game	32	17.8
(d) I play with my friends	31	17.1
(e) I have to sell/hawk after school	28	15.8

Table 4: \	Why	Students	do	not	do	Hon	new	orl	k
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There is an assumption that students do not do their homework regularly and the reasons they do not do their homework vary from external to personal factors. These factors are presented in figure 3.



Fig. 3: Why Students do not do Homework

Helping parents in their work, doing household chores and selling could be referred to as external while watching TV, video or computer games are referred to as personal factors. Majority of the students indicated that they helped their parents in their businesses and that explained why they did not do their homework. Household chores like cleaning, fetching water/firewood, baby-sitting, etc ranked second in what prevented them from doing homework. Watching TV/Video/computer game ranked third in what prevented them from doing homework. While some students heavily blamed their inability to do homework on external factors, other students felt responsible for their actions in that they were playing with friends and watching TV/Video/computer game which preoceupied them and thereby prevented them from doing homework.

Research Question Four

What is the frequency of homework and the amount of time needed for homework?

Information obtained from parents was used in answering this research question. Tables 5 and 6 present parents opinion on the number of homework a junior secondary school student should have in a week and the amount of time needed to complete the homework in a day respectively.

Number of times	Frequency	Percentage
Once a week	24	7.3
Twice a week	172	52.0
Three times a week	81	24.5
Four times a week	34	10.3
Everyday	20	6.0
Total	331	100.0

Table 5: Number of Times of Homework in Junior Secondary School Mathematics

Majority of the parents (52%) preferred the number of homework to be limited to twice a week even when they are aware that their children's timetable specified everyday mathematics lesson. Next to twice a week homework in mathematics for children in junior secondary school is three times a week (24.5%). Very few parents were in the two extremes i.e. 7.3% preferred once a week homework and 6.0% preferred every day homework.

Number of minutes for home work	Frequency	Percentage
1 hour	6	1.8
2 hours	23	6.9
3 hours	42	12.7
4 hours	97	29.3
5 hours	86	26.0
6 hours	67	20.2
More than 6 hours	10	3.0
Total	331	100.0

Table 6: Number of hours for Homework in Junior Secondary School Mathematics per week

Majority of the parents indicated that 4 hours a week is ideal for mathematics homework; their argument may be based on the fact that mathematics is not the only subject offered at junior secondary school. However, a significant number of the parents want their children to do many hours of mathematics homework—up to 6 hours a week. Very few parents were of the opinion that 1 hour is sufficient for mathematics homework.

Conclusion and Recommendations

A significant number of students did not complete their homework for different reasons. The reasons put forward by the students were not trivial, the reasons were cogent especially in a depressed economy like that of Nigeria where majority of the citizenry live below poverty line. Those who completed their homework performed better than those who did not. Parents were of the opinion that limited number of homework should be given to the children and wards and also suggested a four hour homework a week.

One cannot conclude therefore that homework should be abrogated but the amount of homework should be graded according to age or class of the students. Higher classes could be given more homework and lower class should be given fewer number of homework because younger children have less developed study habits and are less able to tune out distractions at home.

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