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Influence of Home Factors on Mathematics' Achievement among Teenage Girls in Edo Central Senatorial District of Edo State, Nigeria

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Abstract

The purpose of the study was to examine the influence of home factors on mathematics' achievement among teenage girls in Edo Central Senatorial District of Edo State. To accomplish this objective, a sample of one hundred teenage female students in senior secondary school one classes was drawn for the study. The study employed the survey research design. The data was collected by using an achievement test in mathematics, which was administered to the sample. Three hypotheses were tested at 0.05 level of significance using the one-way analysis of variance (ANOVA) and T-test to analyze the data. The results of the data analysis showed that marital status and academic background of parents have significant influence on the academic achievement of teenage girls in mathematics while the income parents had no significant influence on the academic achievement of teenage girls in mathematics in Edo Central Senatorial District of Edo State, Nigeria. Based on the findings, it is recommended that parents should show more interest in the educational development of their teenage girls.

Keywords: Teenage Girls, Home Background, Broke Home, Occupation, Academic Achievement.

Introduction

Mathematics is a very influential factor in science and other areas of discipline. It is the foundation of science and technology. The functional role of mathematics in science, technology and business enterprise escapes its application (Okereke, 2006). Furthermore, Siddiqi (2008) citing Galileo says "mathematics occupies a crucial and unique role in human societies. It represents a strategic key in the development of mankind. The ability to compute, relates to the power of technology and social organization, the geometrical understanding of space or time, which includes the physical world and its national patterns Shows the scientific and cultural role of mathematics in the history of civilization. The common wealth countries see it as the Queen of all sciences.

Education on the other hand is a strategy created by societies to promote creativity and citizenship. To promote creativity implies helping people to fulfill their potentials to the

maximum of their capability. To promote citizenship implies showing people their rights and responsibilities in society. Educational systems throughout history and in every civilization have been focused on two issues, to transmit values from past and to promote the future. Hence mathematics, which forms the bedrock of scientific and technological advancement, should be seen by students as means of facing the challenges of life (D'Ambrosio, 2001).

Despite the importance placed on mathematics, researchers like Amazigo (2000); Agwagah (2001); Obioma (2005); Betiku (2001); Maduabum and Odili (2006); Okereke (2006) observe that students lack interest in the subject and so perform poorly in it. They also observed that mathematics is one of the subjects most poorly taught, widely hated and poorly understood in secondary schools. They further added that many students particularly girls run away from the subject due to one reason or the other.

In time past, there was increased interest in the role of affective factor in the learning of mathematics (Leder and Forgasz 2006; Schuck and Gorotenboer, 2004) There is also the assumption that positive mathematical beliefs, attitudes and feelings will lead to increased mathematical achievement. While this seems to be reasonable proposition, it does warrant further investigation (Grootenboer, 2003). Also the relationship between affective factors and learning in mathematics is not simple, rather it is complex. Gresalfi and Cobb (2006) suggest that learning in mathematics is more than just the acquisition of skills and knowledge, it is not sufficient to focus exclusively on the ideas and skill that we want students to learn.

Issues of gender have been a rich area, and probably initiated interest in research about affective factors and mathematics learning. According to Leder (1992) the achievement of girls in mathematics, across a range of different contexts, was lower than that of the boys and this was attributed to a variety of reasons including affective factors. Much of the impetus to explore this area began with concerns about gender and mathematics achievement. Garden (1997) received new Zealand's performance in trends in international mathematics and science study (TIMSS) and found that students have positive attitudes but that from a fairly young age there is an increasing proportion of students having lost interest in the subject, with a concomitant decline in their achievement.

Teenage girls have to tackle the pressure of hanging out with friends, going on an errand or attending other functions where there are other teenagers around. They also feel the pressure of having the right hairstyle, using the right kind of clothes. This type of pressure can be very difficult on a teenage girl, if she is from a family with limited resources. These pressures cumulate in stress, which could in one way or the other affect their mental abilities. This implies that variables within home background, personal characteristics and educational attainment need to be verified. This study therefore investigates the influence of home factors on mathematics achievement among teenage girls in Edo central Senatorial District of Edo State.

The Problem

The West African Examination Council (WAEC) Chief Examiner (2003, 2004, 2005 and 2006) consistently reported candidates' lack of skill in answering most of the questions asked in general mathematics. They further observed that candidate were weak in Geometry of circles and 3-dimensional problems. According to their reports (2003-2005), most candidates avoided questions on 3 dimensional problems. When they attempted geometry question, only a few of

The candidates showed a clear understanding of problems in their workings, WAEC (2004) also reported candidates' weakness in Algebraic expressions and word problems among others. Okereke (2006) attributes student's poor achievement in mathematics to factors such as the view of the society that mathematics is too difficult a subject to cope with According to Leder (1992) "the achievement of girls in mathematics across a range of different contexts, was lower than that of the boys" It was attributed to a variety of reasons including affective factors.

Despite government involvement in secondary education, the academic achievement in mathematics among teenage girls in secondary schools in Edo Central Senatorial District of Edo State of Nigeria still appear to be affected by some home factors. There are homes where the family income poses a big problem to the teenage girls who have to struggle for themselves to make ends meet by selling and having some menial paid jobs outside the school period thereby, having no time for school assignment at home. Some of these teenage girls come from broken or polygamous homes where they have to face unhealthy and uncondusive environment.

The employment of housewives (mothers) outside their homes also has an adverse affect on the teenage girl's achievement in mathematics since the teenage girls automatically step into the shoes of their mothers while they are away from home. The extent these factors have affected the achievement of teenage girls in Edo Central Senatorial District is not known. The problem of the study therefore is to resolve the following questions:

- Does marital status of parents (married, divorced, separated or single) influence the achievement of teenage girls in mathematic?
- Does income of the family influence the academic achievement of the teenage girls in mathematics?
- Does the family educational back ground play a significant role in teenage girls achievement in mathematics?

Research Hypotheses

- Marital status of parents will not significantly influence the academic achievement of teenage girls in mathematics.
- Family income will not significantly influence the academic achievement of teenage girls in mathematics.
- Parental educational back ground will not significantly influence teenage girls' academic achievement in mathematics.

Scope of Study

The study focused on the influence of home factors on mathematics achievement among teenage girls. The study focused on income of the family, family educational background and marital status as factors influencing teenage girls' academic achievement in mathematics at the senior secondary school level in Edo Central Senatorial District of Edo State, Nigeria. Only the female teenage girls at the senior secondary school (SSS) of the selected schools were used in the study. Though teenagers are mainly found in SS1-SS 3 classes, the researcher decided to make use of SS1 while SS2 and SS3 students were left out due to the tight schedule of their final examinations.

Methodology

Research Design

The study was a survey research which was intended to assess the influence of some independent variable (marital, student's family income and academic background) on the academic achievement of teenage girls in mathematics. The survey research was used because the researcher had no control over the independent variables since they had already occurred

Sample and Sapling Techniques

The researcher employed the simple random sampling technique to get the sample for this study. There are seventy (70) secondary schools in Edo Central Senatorial District (five local government areas). Two school from each of the local government areas were sampled, giving a total of 10 secondary schools which serve as the sampled schools for the study.

Ten percent of the female students in SS1 were picked in each of the ten selected schools. This was due to the large number of students that made up the population. The sample consisted of 100 female senior secondary school 1 student.

Instrument for Data Collection

In carrying out the study, the researcher made use of an achievement test in mathematics which was administered to the sample. The researcher constructed 50 items senior secondary school mathematics achievement test (SMAT), using a table of specification. This instrument was used for collecting data in the survey.

Data Analysis

The items in the test instrument was coded on the fact that each section of the test carries points. To ascertain whether there was any significant difference between the students' scores with respect to the generated null hypotheses, the analysis of variance (ANOVA) and the T. test statistics were used for the computation. The hypotheses were tested at 0.05 level of significance.

Findings and Discussion of Result

Hypothesis 1

Hypothesis one, which stated that marital status would not significantly influence the academic achievement of teenage girls in Mathematics was tested using the one way analysis of variance. Results are presented in Table 1 below.

Table 1: Summary of one way ANOVA of marital status (married, divorced and separated/single) and achievement of teenage girls in Mathematics.

Sources of variables	SS	DF	MS	F	Sig
Between group	83743.543	2	41871771	64.698	.000
Within group	62777.457	97	647.190		
Total					

Result Presented in the table I revealed that marital status significantly influenced the academic achievement of teenage girls in mathematics. $F(2, 99) = 64.689, p < .05$. Since there was

a statistically significant f ratio, the Turkey Honestly Significant Difference test (HSD) was carried out to test the source of the significance. Result is presented in table 2.

Table 2: Honestly significant Difference (HSD) multiple comparisons test, Married, Separated/Single and Divorce compared.

(I) Marital status	(J) Marital status	Mean Difference (I - J)	Std. Error	Sig
Separated /single	Divorce	16.824	10.907 6.834	.126
	Married	-60.830		.000
Divorce	Separated /Single	-16.824	10.907 9.462	.126
	Married	-77.653		.000
Married	Divorced	-77.653	9.462	.000
	Separated / Single	-60.830	6.834	.000

- The mean difference is significant at the 0.05 levels.
- The mean difference between separated/single and divorce was 16.824.

The mean difference between separated/single and married is -60.830 and was significant at 0.05. There was also a significant difference between the mean of divorce and married (-77.653). The results indicated that teenagers from a married home where both parents are together perform better on the achievement test in Mathematics than teenage girls from divorce and separated/single homes.

This finding is in consonance with that of Hyde, Fennema, Ryan, Frost and Hope (1996) who found that children from married homes whose parents are together perform better than those from separated homes. It is also in agreement with Lindgreen (1996) who found that children from broken homes have more difficulties with academics at school. This is so because a family where both parents are together is a good factor that can motivate the child to learn rather than a separated or single or divorced parents where the child does not have the privilege of love and control from both parents. The more a home is stable, the more secured the children will be at home. Essential relationships are not promoted in broken homes and this gradually wears off at a very impressionable time. Due to this effect the teenage girls living in such homes are often bewildered by several problems which effect their academic achievement

Hypothesis 2

Hypothesis two which stated that family income would not significantly affect the academic achievement of teenage girls in mathematics was tested using the one –way analysis of variance. Results are presented in table 3 below.

Table 3: Summary of one –way ANOVA of family income on academic achievement of teenage girls in mathematics.

Sources of variable	SS	DJ	MS	F	SIG
Between Groups	1571.719	2	785.859	.830	.439
Within Groups	91811.281	97	946.508		
Total	93353.00	99			

The results indicate that the difference was not statistically significant at the 0.05 level of significance. The null hypothesis was therefore retained implying that family income does not significantly affect the academic achievement of teenage girls in mathematics.

This finding is however not in conformity with the finding of Durbey et al (1998) that family income affects the academic achievement of students because parents of relatively high classes are able to provide their children with more opportunities to learn those things which will aid their learning in school. They also have the money to provide for the children, the necessary school materials to learn which is not applicable to low income families.

Supporting this finding, Maynard (1980) and Callaghan (1993) noted that it has been found that children of rich men and chiefs are less active than others (poor) when taught in school. They are lazier and show poorer results. Maynard (1980) further noted that the children from high-income homes believe that good jobs await them at the end and so may not bother themselves as others do academically. The insignificance of income status of parents on student's academic achievement in their areas of studies can be attributed to fact that students from low-income homes receive necessary encouragement to work harder and achieve better result than those from high income homes.

Hypothesis 3

Hypothesis three, which stated that parental educational background, will not significantly affect teenage girls' academic achievement in Mathematics was tested using the t-test for independent measure. Results are presented on table 4 below.

Table 4: independent t-test showing the mean difference between literate and illiterate parents on academic achievement of teenage girls in mathematics

Variable	Group	N	Means		df	t	Sig
Achievement of teenage girls in mathematics	Illiterate Parents	20	10.20	6.53	98	3.232	<.05
	Literate Parents	80	15.5	4.02			

Result from table 4 indicated that girls from literate parents perform better in mathematics than girls from illiterate parents. Thus the null hypothesis was rejected at the 0.05 significance $t=3.232$, $df\ 98$, $P < 0.05$.

This implies therefore that parents' educational background significantly affect the academic achievement of teenage girls in mathematics in Edo Central Senatorial District of Edo State. This can possibly be traced to the fact that the academic qualification a parent acquires acts as a boost to the academic achievement of the child. This finding is supported by Philips (1998) who found that parental education and socio economic status have an impact on students' achievement.

Although the finding of this study shows that parental educational background can significantly affect the academic achievement of teenage girls in Mathematics, some writers believe that educational background as a factor of the home has no significant role to play in a child's academic achievement but rather the attitude or interest shown by parents towards their children's progress at school irrespective of the home background. Supporting this view, Amioku (1994) said that it is not the parents' occupations that determine the level of academic achievement of the child. With references to the contribution of some psychologists skinner,

Pavlov and wanton on the factors responsible for good and poor performance of a child in school. Jean Piaget in cognitive development explained that Some parents spend long hours at work and unable to have enough time for their children's intellectual works. Most parents find it difficult to give attention to their children's questions about academic works despite their level of literacy, while some concluded that this may have adverse effect on the child's intellectual growth and may lower the child's achievement in school.

However, the findings of this study negate the contribution of (Amioku, 1994). Therefore, it may be said that a child whose parents are literate do better academically than a child of an illiterate parents. This tends to suggest that educated parents want the best for their children since they know the value of education and so make provisions for their children. They believe that the school curriculum is purely academic, which is the kind of education that creates awareness.

Conclusion

Based on the findings, it was concluded that marital status of parents and their educational background significantly influence the academic achievement of teenage girls in mathematics, while the income of parents had no significant influence on the academic achievement of teenage girls in mathematics in Edo Central Senatorial district of Edo State, Nigeria.

It is therefore recommended that parents should show their interest in the educational development of their children especially their teenage girls.

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