

## Empirical study of the effect of type of family and extra lesson on students' academic performance: A case study of some selected schools in Kwara State, Nigeria

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### Abstract

Extra lesson for students has been adopted by schools and families in Nigeria to enhance academic performance. The study was undertaken to investigate the effect of type of family and type of extra lesson on students' academic performance. The students' academic performance was from test administered jointly by the teachers and enumerators on 1,191 students in 24 randomly selected schools, eight each from the three senatorial districts. The effects of type of family, extra lesson and interaction between family and extra lesson were determined using a two-way analysis of variance. The result indicates that type of family ( $p$ -value = 0.021) and type extra lesson ( $p$ -value=0.001) have a significant effect on students' academic performance, but the interaction between the two factors ( $p$ -value=0.081) does not have significantly effect. Further investigation revealed that students from monogamy family performed significantly better than those from polygamous families. Also, students involve in holiday lesson and home lesson did significantly better than those participating in school extra lesson. It is important that parents should have more time for their wards after school hours instead of transferring their responsibilities to the teachers by extending the school hours because of extra lesson.

**Keywords:** Extra lesson, family, academic performance, students' enrolment, analysis of variance.

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## 1. Introduction

The educational system in Nigeria is so dynamic and has witnessed a lot of changes in the past years. Some of these changes are not directly as a result of government policies but sometimes by stakeholders, such as parent and guardians. The involvement of parents in child education cannot be over emphasised because in their upbringing they are the first teachers to a child. Hardon (1998) described family role in education as an ocean, indispensable for education and most important source of education.

Sometime ago, in the seventies and eighties, extra lesson was not common, like it did not exist at all. It was when the Secondary School Certificate Examination results were getting poorer that parents took extra steps to pay for extra lesson teachers at home for their wards. The issue now is whether extra lesson has yielded the required result. Based on the study conducted by Abdullahi, Mlozi and Nzalayaimisi (2015), extra lesson was one of the 19 independent variables to student achievement in an heterogeneous setting. It was revealed that students who came from a good economic family background that can support their children at both home and school did better.

The trend of making up additional time for learning for students led to schools adding extra time after the normal school lesson. This also witnessed the establishment of extra lesson centres. Family/parents/guardians always seek for a better academic performance of their children, but there are some factors that affect the level of involvement and children academic performance. One of these factors is type of family, which Ella, Odok and Ella (2015) discovered in their study where in family type has a significant influence on students' academic performance.

The types of families considered are monogamy, polygamy, single parents and others (extended family, step family, grand parent family, foster family, etc.), while the extra lessons are school extra lesson, centre lesson, home lesson and holiday lesson.

This study aimed to investigate students' family background in terms of type of family, the type of extra lesson and interaction between type of family and extra lesson impacts on academic performance. In order to achieve these, 1,191 students were randomly selected from 24 secondary schools in Kwara State, Nigeria, made up of eight secondary schools from each of the three senatorial districts of Kwara State.

## 2. Literature review

The purpose of extension of official study hour for students/pupils is to improve their academic performance. It is done at no cost by some schools to cover the scheme of work especially for students preparing for public examinations. In some schools and in all classes, mostly private schools, students pay fees. Apart from school extra lesson, other types of lessons also attract fees, except those on voluntary basis. The National Population Commission (2004) in its report of the Basic Education Profile for North East Nigeria stated that the highest percentage of parental contribution and involvement in money and time goes to extra lesson with about 38%.

Family/parent/guardian played a major role in student involvement in extra lesson, especially when it has to do with the cost of funding extra lesson. Ermisch and Francesconi (2001) and Grawe and Mulligan (2002) in their studies came to the fact that economic resources and potentials of the parents are significantly correlated. This according to them is students from prestigious occupations can afford to pay for extra lesson and other education services. In the study conducted by Akinleke (2017), family structure was considered in terms of single parent and two parents. The purpose was to determine the effect of family structure on students' academic performance using the *t*-test in which 220 students were selected from the public secondary schools in Yewa Local Government Area of Ogun State, Nigeria. They revealed that children with two parents performed better than those with a single parent.

Lochan and Barrow (2008) in the study of extra lessons in Trinidad and Tobago discovered that the responses of two sets of students on whether extra lesson do matter had a high positive correlation. The study also revealed that extra lesson helps in academic performance regardless of type of school. This confirmed the claim that extra lesson does enhance academic performance of students. They based their finding on information gathered from students without actually testing the students understanding based on extra lesson periods or no extra lesson.

Stewart (2015) in the study of conditions underlying extra lesson in Jamaica was of the opinion that extra lessons is to provide remedial and/or gifted education due to a lack of educational capacity and inadequacy of factors that would be as a drive to educational decolonisation.

There are many statistical tools that are useful in analysing factors that affects students' academic performance. One such tool is the analysis of variance (ANOVA), which is used when the levels of the factor(s) are more than two (Bakoban & Aljarallah, 2015; Irfan & Shabana, 2012; Kyoshaba, 2009; Mouhamadou, 2014).

Ellaetal. (2015) classified family into four categories which are monogamy, polygamy, separated and divorced. One-way ANOVA was used to analyse the data collected. The result of the analysis showed that the type of family significantly influenced students' academic performance.

Farooq, Chaudhry, Shafiq and Berhanu (2011) used ANOVA to investigate the effect of socio-economic status, parental education and occupation on quality of students' academic performance. The students' academic achievement was only significantly influenced by socio-economic status and parents' education. In general, family involvement is important to young children's literacy (Frances, Michelle, Chrishana & Therese, 2013).

Therefore, this paper aims is to determine the level of influence of type of family, type of extra lesson and the interplay between extra lesson and type of family on students' academic performance. These can be achieved by using a two-way ANOVA (with interaction) which has been neglected by many authors.

### **3. Methodology**

#### **3.1. Sample and sampling technique**

The secondary schools in each of the three senatorial districts of Kwara State were stratified into private secondary schools and public secondary schools. A total of eight schools were selected which comprised three private schools and five public schools using the simple random sampling technique.

25 students were selected each from JSS II and SSS II at random by the class teacher if there were more than 25 students in a class, but if less all of them were selected.

#### **3.2. Research instruments**

The research instruments used in this study were questionnaire and assessment test. There were two questionnaires; one was constructed for JSS II students and the other for SSS II students. The questionnaires were validated by experts. Reliability test was conducted using the split-half reliability method which gave a coefficient of 0.86 and 0.82 for JSS II questionnaire and SSS II questionnaire, respectively.

The assessment test comprised English, Mathematics, Basic Technology and Basic Science for JSS II and English, Mathematics and Biology for SS II. The questions were set by professional teachers based on their core areas of interest in teaching.

### 3.3. Data collection

The data collected for this study was from 1,191 students of JSS II and SSS II from the selected schools. The data on type of family were collected through the administration of the questionnaires. The data collected on academic performance was from general assessment test with questions from core subjects. They are English, Mathematics, Basic Technology and Basic Science for JSS II and English, Mathematics and Biology for SS II. The assessment test was impromptus, to avoid preparation for assessment which may not give a true academic standard of students. This is to reduce the weight of the argument that 'examination is not a true test of knowledge'. The assessment tests were administered by enumerators and supervised by teachers.

The data on family type and extra lesson type were collected through the administration of the questionnaires.

### 3.4. Two-way ANOVA

The two-way ANOVA determines the effect of two factors that are on a response. The two factors can be represented by A and B, which are type of family and type of extra lesson, respectively. The two factors A and B have  $i$  and  $j$  levels, respectively.

**Model:**  $y_{ij} = \mu + \alpha_i + \beta_j + (\alpha\beta)_{ij} + e_{ij}$

$i = 1, 2, 3, \dots, a$

$j = 1, 2, 3, \dots, b$

Where

$\mu$  is the grand mean response (intercept),

$\alpha_i$  is the effect due to the  $i$ th level of factor A,

$\beta_j$  is the effect due to the  $j$ th level of factor B,

$(\alpha\beta)_{ij}$  is the effect of any interaction between  $i$ th level of factor A and  $j$ th level of factor B,

$e_{ij}$  is the random error.

**Table 1. ANOVA table**

Source	Sum of squares	Df	Mean square	$F_{ratio}$
Intercept	SS(Intercept)	(ab-1)	MS(Intercept)	$\frac{MS(Intercept)}{MSE}$
Factor A	SS(A)	(a-1)	MS(A)	$\frac{MS(A)}{MSE}$
Factor B	SS(B)	(b-1)	MS(B)	$\frac{MS(B)}{MSE}$
Interaction (Factor A*Factor B)	SS(AB)	(a-1)(b-1)	MS(AB)	$\frac{MS(AB)}{MSE}$
Error	SS(Error)	(N-ab)	MS(Error)	
Total(corrected)	SS(Total)	(N-1)	MS(Total)	

The Test Statistics are

$$F_{ratio(intercept)} = \frac{MS(Intercept)}{MSE}$$

$$F_{ratio(A)} = \frac{MS(A)}{MSE}$$

$$F_{ratio(B)} = \frac{MS(B)}{MSE}$$

$$F_{ratio(AB)} = \frac{MS(AB)}{MSE}$$

(Seltman, 2018)

If there is any significance, the *post-hoc* test will be carried out using Fisher's least significant difference (LSD) test to determine the pairs that are significant(Seltman,2018),

#### 4. Descriptive analysis

**Table 2. Frequency distribution of students' average score**

	Average score	Frequency	Percent	Valid percent	Cumulative percent
Valid	75–100	28	2.4	2.4	2.4
	70–74	26	2.2	2.2	4.5
	65–69	30	2.5	2.5	7.1
	60–64	40	3.4	3.4	10.4
	55–59	52	4.4	4.4	14.8
	50–54	54	4.5	4.5	19.3
	45–49	80	6.7	6.7	26.0
	40–44	69	5.8	5.8	31.8
	0–39	812	68.2	68.2	100.0
	Total	1,191	100.0	100.0	

Own Survey (2019).

The average score comprised scores of students for English, Mathematics and Basic science for JSS II and English, Mathematics and Biology for SSS III. The grouping of the scores satisfied the following grading: 75–100 (A1/Excellent), 70–74 (A2/Very Good), 65–69 (B3/Good), 60–64 (C4/Credit), 55–59 (C5/Credit), 50–54 (C6/Credit), 45–49 (P7/Pass), 40–44 (E8/Pass) and 0–39 (F9/Fail).

This implies that 28 students are in A1 or excellent grade, representing 2.4% of 1,191 students, 26 students are in A2 or very good grade, representing 2.2%, 30 students are in B3 or very good grade, representing 2.5% and 146 either have C4 or C5 or C6, which are classified as credit, representing 12.3%, 149 students are in P7 and E8 classified as pass, representing 12.5% and 812 students failed (F9), representing 68.2%.

It should be noted that the assessment test was impromptu; therefore, it may not represent the academic performance of the students of the selected schools in public or other examinations.

**Table 3. Students' distribution on family type**

	Family	Frequency	Percent	Valid percent	Cumulative percent
Valid	Polygamy	392	32.9	32.9	32.9
	Monogamy	609	51.1	51.1	84.0
	Single parent	177	14.9	14.9	98.9

Others	13	1.1	1.1	100.0
Total	1,191	100.0	100.0	

The questionnaire was administered to 1,191 students, out of which 392 (32.9%) were from polygamous families, while 606 (51.1%) were from Monogamous families. The number of students from single parents were 177 (14.9%) and others were 13 (1.1%) students.

**Table 4. Students' distribution on type of extra lesson**

Type of extra lesson	Frequency	Percent	Valid percent	Cumulative percent
School extra lesson	570	47.9	47.9	47.9
Centre lesson	126	10.6	10.6	58.4
Valid Home Lesson	269	22.6	22.6	81.0
Holiday lesson	226	19.0	19.0	100.0
Total	1,191	100.0	100.0	

Own Survey (2019).

The highest number of students involved in school extra lesson is 570 students, representing 47.9% of the 1,191 students. The home lesson followed by having 269 students with 22.6%. The holiday lesson followed the home lesson with 226 students representing 19% and the least was centre lesson with 126 students representing 10.6%.

**Table 5. Type of family and type of extra lesson cross tabulation**

		Type of extra lesson				Total
		School extra lesson	Centre lesson	Home lesson	Holiday lesson	
Family	Polygamy	180	45	104	63	392
	Monogamy	289	63	131	126	609
	Single parent	94	15	32	36	177
	Others	7	3	2	1	13
Total		570	126	269	226	1,191

Own Survey (2019).

Table 5 shows the type of family and their participation in different types of extra lessons. Students from a monogamous family have the highest number (289 out of 570 in school extra lesson of the total participation in school extra lesson but the highest participation in proportion to the number of students from each type of family is from 'others' with 53.8%, that is, seven out of 13 students from 'others'. The highest proportion to the number of students from each type of family in centre lesson also came from other types of families (others) with 23.1% which is three out of 13 students, but highest number of 63 out of 126 students in centre lesson was from monogamy. In case of home lesson, students from monogamy have the highest number of 131 out of 269 in home lesson, but the highest proportion to the number of students from each type of family is 26.5%, meaning 104 out of 392 students. Monogamy took the lead in holiday lesson with 126 out of 226 students and the proportion base on each type of family with 20.7%, meaning that 126 out of 609 students from monogamy participated in holiday lesson.

**Table 6. Type of family mean score distribution**

Family	Mean	Std. Error	95% confidence interval	
			Lower bound	Upper bound
Polygamy	31.7	1.024	29.672	33.689
Monogamy	34.4	0.829	32.722	35.974
Single parent	30.1	1.638	26.912	33.339
Others	42.7	6.235	30.445	54.912

Own Survey (2019).

The mean score of students from each type of family mentioned above indicates that students from 'others' took the lead with 42.7, followed by students from monogamy with 34.4. This is followed by polygamy and single parent with 31.7 and 30.1, respectively.

**Table 7. Type of extra lesson mean score distribution**

Type of extra lesson	Mean	Std. Error	95% confidence interval	
			Lower bound	Upper bound
School extra lesson	27.0	1.788	23.509	30.525
Centre lesson	34.5	2.936	28.712	40.232
Home lesson	32.3	3.285	25.834	38.724
Holiday lesson	45.1	4.549	36.140	53.989

Own Survey (2019).

Table 7 shows the mean score of students from each type of extra lesson which indicates that students from holiday lesson took the lead with 45.1, followed by students from centre lesson with 34.5. After centre lesson is home lesson and school extra lesson with 32.3 and 27.0, respectively.

**Table 8. Type of family with type of extra lesson mean score distribution**

Family	Type of extra lesson	Mean	Std. deviation	N
Polygamy	School extra lesson	29.67	17.494	180
	Centre lesson	32.11	20.739	45
	Home lesson	32.40	17.845	104
	Holiday lesson	32.54	16.186	63
	Total	31.14	17.770	392
Monogamy	School extra lesson	31.73	17.183	289
	Centre lesson	34.44	19.430	63
	Home lesson	35.31	19.052	131
	Holiday lesson	35.91	17.679	126
	Total	33.65	17.992	609
Single parent	School extra lesson	30.96	17.433	94
	Centre lesson	26.33	19.223	15
	Home lesson	31.41	17.517	32
	Holiday lesson	31.81	14.936	36
	Total	30.82	17.040	177
Others	School extra lesson	15.71	13.363	7
	Centre lesson	45.00	17.321	3
	Home lesson	30.00	0.000	2
	Holiday lesson	80.00		1
	Total	29.62	22.864	13

Own Survey (2019).

The first and second highest mean scores in Table 8 are 80 and 45 for students from other types of family who are engaged in holiday lesson and centre lesson, respectively. It is followed by students from single parents in centre lesson with a mean score of 45. The next is monogamy in holiday lesson with 35.91.

## 5. Result and discussion from ANOVA

The hypotheses for this study are stated in the following section.

### 5.1. Hypotheses

1.  $H_0$ : There is no significant difference between types of families on students' academic performance  $V_s$   
 $H_1$ : There is a significant difference between types of families on students' academic performance
2.  $H_0$ : There is no significant difference between types of extra lessons on students' academic performance  $V_s$   
 $H_1$ : There is a significant difference between types of extra lessons on students' academic performance
3.  $H_0$ : There is no significant difference between interaction of types of families and types of extra lessons on students' academic performance  $V_s$   
 $H_1$ : There is a significant difference between types of families and types of extra lessons on students' academic performance

The ANOVA carried out using the data collected from students with the test score (students' performance) as dependent variable is shown in Table 9. The 5% level of significant is used in this analysis.

**Table 9. ANOVA table.**

Source	Type III sum of squares	Df	Mean square	F	Sig.
Corrected model	9,895.353 <sup>a</sup>	15	659.690	2.096	0.008
Intercept	140,134.177	1	140,134.177	445.173	0.000
Type of family	3,082.744	3	1,027.581	3.264	0.021
Type_of_extra_lesson	5,058.439	3	1,686.146	5.356	0.001
Family_type*type_of_extra_lesson	4,864.880	9	540.542	1.717	0.081
Error	369,873.413	1,175	314.786		
Total	1,626,575.000	1,191			
Corrected total	379,768.766	1,190			

$F_{ratio(Family\ type)} = 3.264$  with corresponding  $p = 0.21$  leads to the rejection of the null hypothesis 1, meaning that type of family contributed significantly to students' academic performance.

$F_{ratio(Extra\ lesson\ type)} = 5.356$  with corresponding  $p = 0.001$  leads to the rejection of null hypothesis 2, meaning that type of extra lesson contributed significantly to students' academic performance.

$F_{ratio(Family\ \&\ Extra\ lesson\ type)} = 1.717$  with corresponding  $p = 0.081$  leads to the acceptance of null hypothesis 3, meaning that the interaction between type of family and type of extra lesson does not contribute significantly to students' academic performance.

The significance of type of family and type of extra lesson on students' academic performance need to be investigated to know the pairs that contributed significantly in each case. This is carried out by using *post-hoc* test of Fisher's LSD.

**Table 10. Multiple comparisons between means performance based on type of family**

(I) Family	(J) Family	Mean difference (I-J)	Std. Error	Sig.	95% Confidence interval	
					Lower Bound	Upper Bound
Polygamy	Monogamy	-2.51*	1.149	0.029	-4.76	-0.26
	Single parent	0.32	1.607	0.844	-2.84	3.47
	Others	1.52	5.002	0.761	-8.29	11.33
Monogamy	Polygamy	2.51*	1.149	0.029	0.26	4.76
	Single parent	2.83	1.515	0.062	-0.15	5.80



	Others	4.03	4.973	0.418	-5.73	13.79
	Polygamy	-0.32	1.607	0.844	-3.47	2.84
Single parent	Monogamy	-2.83	1.515	0.062	-5.80	0.15
	Others	1.20	5.098	0.813	-8.80	11.21
	Polygamy	-1.52	5.002	0.761	-11.33	8.29
Others	Monogamy	-4.03	4.973	0.418	-13.79	5.73
	Single parent	-1.20	5.098	0.813	-11.21	8.80

There is significant difference in the academic performance of students from a polygamous family and monogamous family with  $p = 0.029$ . Investigating further into this using their means scores shows that students from a monogamous family performed significantly better than those from a polygamous family.

**Table 11. Multiple comparisons between means performance based on type of extra lesson**

(I) Type of extra lesson	(J) Type of extra lesson	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower bound	Upper bound
School extra lesson	Centre lesson	-2.14	1.747	0.220	-5.57	1.28
	Home lesson	-2.93*	1.312	0.026	-5.50	-0.35
	Holiday lesson	-3.76*	1.395	0.007	-6.50	-1.02
	School extra lesson	2.14	1.747	0.220	-1.28	5.57
Centre lesson	Home lesson	-0.78	1.915	0.683	-4.54	2.97
	Holiday lesson	-1.62	1.973	0.413	-5.49	2.25
	School extra lesson	2.93*	1.312	0.026	0.35	5.50
Home lesson	Centre lesson	0.78	1.915	0.683	-2.97	4.54
	Holiday lesson	-0.83	1.601	0.603	-3.97	2.31
	School extra lesson	3.76*	1.395	0.007	1.02	6.50
Holiday lesson	Centre lesson	1.62	1.973	0.413	-2.25	5.49
	Home lesson	0.83	1.601	0.603	-2.31	3.97

The comparison shows that the school extra lesson and holiday lesson have significant differences in their contributions to students' academic performance with  $p = 0.007$ . Also, school extra lesson and home lesson have significant differences in their contributions to students' academic performance with  $p = 0.026$ . Based their means and with the result mentioned above, it can be deduced that students who engaged in holiday lesson performed significantly better than those in school extra lesson. Those in home lesson performed significantly better than those in school extra lesson.

## 6. Conclusion

This study was initiated to unveil the fact about the effect of type of family and type of extra lesson on students' academic performance using students from some randomly selected secondary schools in the three senatorial districts of Kwara State, Nigeria. The findings derived from analysis clearly show that there is a significant contribution of type of family and type of extra lesson on students' academic performance.

## 7. Recommendations

The findings of this study can be used to determine where effort should directed to by parents, guardian and other stake holders in order to get the best out of their wards in terms of academic performance.

Therefore, the followings are required:

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- ✓ Students should not be kept longer in school unnecessarily after normal school hours, but instead organise short holiday lessons for them especially a during long vacation.
- ✓ Parents or guardians should endeavour to have more time for their children at home so as to know their peculiar and special needs.

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