

Analysis of the Performance of Second-Cycles Students in Core-Mathematics in Kassena-Nankana and Asuogyaman Districts of Ghana

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Abstract

This paper investigates the analysis of the performance of Second – Cycles Students in Core – Mathematics in Kassena – Nankana and Asuogyaman districts of Republic of Ghana. We made use of ex-post facto research design using a multistage probability proportion to size (MPPS) method to select the sample from the population used in this study. Three hypotheses were tested while the analyses of data were presented using regression models with t – test statistic. The study has implication for policy and practice in educational sector.

Keywords: Analysis, Performance, Second – Cycles Students, Core- Mathematics, Elective – Mathematics, S.S.C.E

Introduction

Comments and statements about the state of our schools particularly in Secondary and Tertiary levels indicate that the standards of education have fallen. Especially references have been made to performance in such subjects as Mathematics, English Language and Biology in the West Africa School Certificate Examination (WASCE) and Senior Secondary Certificate Examinations (SSSCE). Many references have been made to Mathematics and English Language as prerequisite so success in overall examination as in Secondary School level. Those who point to the controversial issue possibly supply that the performance in Ghana Educational System is declining when compared with the past standards.

We are all quite aware the importance and position of Mathematics and the prime place it occupies in our Society today and on the curricular of the Basic Schools, Secondary and Tertiary levels of Education in Ghana. As we all know, Mathematics will continue to take pre-eminence in the Society and at levels of the educational strata. Much attention therefore has to be paid to Mathematics. This is the more reason when we consider the fact that mathematics can make or mar the progress of a student along the educational or employment or political ladder. We have often heard students saying they have been “looking for Mathematics” for 4, 5, 6 even 7 years. In other words Mathematics has been the impediment or hindrance to their progress, out of all the subjects on the school curriculum it is

Mathematics that records the most woeful and heart rending results in publicly conducted examinations.

Statement of Problem

The present state of performance of Secondary School students as measured by West African Examination Council (WAEC) has assumed a declining trend, and the quality of products being graduated yearly i.e. failing, which is to the dissatisfaction of the general public. We need therefore to find solutions to the problems we face in Mathematics.

Many reasons have been attributed for the high failure rate in our secondary schools; some people traced the high failure rate to student inability to comprehend the principles of Mathematic. Others are of the view that the abysmal performance is due to loaded curriculum (there is too much to be taught within a short time). Yes again some people blame it on lack of proper supervision on the part of school administration. However, because of the peculiar nature of mathematics and the failure rate, that led to the research on the analysis of the performance of second cycle students in mathematics. Attempts were therefore made to test the following hypothesis.

HO₁: There is no significant differences between the performance of boys and that of girls in SSCE Mathematics.

HO₂: There is no significant difference between the performance of elective mathematics student and non elective mathematics students

HO₃: There is no significant difference between the performance of private school and public school

Purpose of the Study

The purpose of the work is to find the trend of students' performance in mathematics.

Methodology

The investigation of the study was carried out ex-post facto. A multi-stage probability proportion to size (MPPS) sampling technique was use to determine the number of schools to be chosen as sample. These schools were randomly selected form two districts in Ghana (Kassena/Nankana district in Upper East Region and Asuogyaman district in the Eastern Region of Ghana). The selection of the four schools was purposive:-NDSSS was selected mainly because it is a single sex school and a mission school. Navasco and Akwamusec were selected because they are the typical mixed schools of the two districts. They represent the normal government co-educational schools of the respective districts and AIS was selected because it is a private school.

Table I: Frequency distribution of students for performance analysis

REGION OF THE CHOICE OF SSS			SEX		Total
			Female	Male	
EASTERN	Schools	AKW	17	15	32
		AIS	12	11	23
		Total	29	26	55
UPPER-EAST	Schools	NDSS	6	30	30
		NAV	6	20	26
		Total		50	56

Table II: Residential Status with course of study frequency distribution of Students for performance in terms of sex cross-tabulation.

Sex			Elective maths status		Total
			Non elective Maths student	Elective Maths student	
Female	Residential status	Boarder	57	17	74
		Day	47	11	58
	Total		104	28	132
Male	Residential status	Boarder	33	27	60
		Day	43	17	60
	Total		76	44	120

Table III: Region frequency distribution of Students for performance analysis

Region of school	Public/ Private		Total
	public	private	
Eastern Region Schls selected: AKWAMUSEC	252		252
AIS	252	211	211
Total		211	463
Upper-East Region Schls selected: NDSSS	77		77
NAVASCO	447		447
Total	524		524

Table IV: Showing descriptive for Sex

Sex	Mean	Std. Deviation	Kurtosis	Skewness
Female	40.583	18.8377	-1.086	.256
Male	54.496	21.5784	-.900	-.049
Total	47.208	21.3174	-.910	.190

Table V: Showing descriptive for Course of Study

Students	Mean	Std. Deviation	Kurtosis	Skewness
Non elective mathematics	40.186	17.6309	-.685	.298
Elective mathematics	64.764	19.6284	.150	-.817
Total	47.208	21.3174	-.910	.190

Table VI: Showing descriptive for Residential Status

Boarder/day	Mean	Std. Deviation	Kurtosis	Skewness
Boarder student	49.280	22.6743	-1.058	.154
Day Students	44.856	19.4927	-.841	-.131
Total	47.208	21.3174	-.910	.190

Table VII: Showing descriptive for Public/Private Schools

Public/Private	Mean	N	Std. Deviation	Kurtosis	Skewness
Public	47.503	776	22.4254	-1.114	.140
Private	72.161	211	20.1665	.903	-1.322
Total	52.774	987	24.1702	-1.246	-.058

Table VIII: Showing descriptive according to regions.

Region of school	Mean	N	Std. Deviation	Kurtosis	Skewness
Eastern Region	58.321	463	24.1599	-1.168	-.278
Upper-East Region	47.873	524	23.1183	-1.237	.093
Total	52.774	987	24.1702	-1.246	-.058

Table IX: comparison of mathematics SSCE results for selected schools

NAME OF SCHOOL	A	B	C	D	E	F	Total
NDSSS	34 (44.2%)	24 (31.2%)	10 (13.0%)	9 (11.7%)	0 (0.0%)	0 (0.0%)	77
NAVASCO	16 (3.6%)	42 (9.4%)	44 (9.8%)	56 (12.5%)	120 (26.8%)	169 (37.8%)	447
KWAMUSEC	20 (7.9%)	28 (11.1)	12 (4.8%)	29 (11.5%)	95 (37.7%)	68 (27.0%)	252
AIS	108 (51.2%)	31 (14.7%)	24 (11.4%)	14 (6.6%)	19 (9.0%)	15 (7.1%)	211
TOTAL	178 (18.0%)	125 (12.7%)	90 (9.1%)	108 (10.9%)	234 (23.7%)	252 (25.5%)	987

Table IX shows the comparison of Mathematics SSCE results of the selected schools of our case study. For convenience and easy understanding, the number of passes, percentages and the total number of students that sat for the examination. It was observed that a higher percentage of performances (A and B) found in AIS and NDSSS been because AIS is a private secondary school and NDSSS is a single sex school and mission school.

Table X: Descriptive For 2005 Ssce Mathematics Results For The Selected Schools

SCHOOLS	N	MEAN	S. D	KURTOSIS	SKEW NESS	STD. ERROR	95% C. I. FOR MEAN	
							L. BOUND	U BOUND
NDSSS	77	76.442	10.8364	-1.178	-.326	1.2349	73.982	78.901
NAVASCO	447	42.952	21.0128	-1.144	.250	.9939	40.999	44.905
AKWAMUSEC	252	46.732	20.9349	-.776	-.247	1.3188	44.135	49.329
AIS	211	72.161	20.1665	.903	-1.322	1.3883	69.424	74.898
TOTAL	987	52.774	24.1702	-1.246	-.058	.7693	51.264	54.284

Table X, is a descriptive of the results of the 2005 SSCE in Core mathematics for the four schools selected. We can see that results of students of NDSSS were more precise and unique than all the other schools –the standard deviation is approximately half of that of the other school. Using the means to make comparison, one would say that NDSSS comes top with 76.4, followed by AIS (72.2), and then Akwamusec (46.7) and Navasco with an average of 43.0.

Table XI: ANOVA Table between results of the Sexes

	Sum of Squares	df	Mean Square	F	Sig.
Male	12166.481	1	31066.311	29.850	.000
Female	101896.3	250	407.585		
Total	114062.8	251			

Table XII: ANOVA Table between results of Elective mathematics and non Elective mathematics Students

	Sum of Squares	df	Mean Square	F	Sig.
Elective maths.	31066.311	1	31066.311	93.577	.000
Non Elective maths.	82996.501	250	331.986		
Total	114062.8	251			

Table XIII: ANOVA Table between results of the Private School and the Public Schools

	Sum of Squares	df	Mean Square	F	Sig.
Private	100870.1	1	100870.100	209.106	.000
Public	475150.5	985	482.386		
Total	576020.6	986			

Table XIV: Regression Model of results in terms of course of study, residential status and sex

Model	Unstandardized coefficient		standardized coefficient	T	Sig.
	B	Std. Error	Beta		
Constant	29.593	4.620		6.406	.000
Sex	10.662	2.245	.250	4.749	.000
Elective Maths status	22.225	2.490	.472	8.925	.000
Residential status	-3.047	2.225	-.071	-1.369	.172

Table XV: Regression Model of results in terms of course of study and sex

Model	Unstandardized Coefficient		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant	25.369	3.445		7.363	.000
Sex	10.418	2.242	.245	4.647	.000
Elective Maths Status	22.610	2.479	.480	9.122	.000

Table XVI: Correlations with Students' Marks

	Sex**	Elective Maths status**	Residential status	Public/private**
Person correlation	.327	.522	-.104	.418
Sig. (2-tailed)	.000	.000	.000	.000
N	252	252	252	252

Concluding Remark of the Analysis of the Findings

The study examined the analysis of the performance of Second Cycles students in Core Mathematics in Kassena-Nankana district in the Upper East Region and Asuogyaman district in Eastern Region of the Republic of Ghana among the selected schools as the case study.

The study Revealed That

- There was a significant difference between the academic performance of boys in Mathematics (SSCE examination) and girl's performances in Mathematics (SSCE examination) i.e. the boys performed better than the girls. The reason given for this is that the girls relax when in the presence of boys thinking inferior of themselves during teaching and learning.
- There was a significant difference between the performance of elective mathematics students and non elective mathematics students. Reason been that they were been taught deeply in elective mathematics and it is more involving than core mathematics.
- There was significant difference between the performances of private school students in mathematics than the performance of public school students. This is as a result of the fact that

private schools did better than the government schools because they were well taught and monitor in private schools than government (public) schools.

Recommendations

In line with the findings of this study, the following suggestions were made:

Government should bridge the gap between the performance of students in mathematics in private school and public school, by motivating and given better remuneration to public teachers. The teachers will therefore work very hard.

Government/society should encourage the girls students that are performing very well by given them scholarship, they will motivate other girls to be more serious.

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