ISSN 2962-5548
https://doi.org/10.56773/ejer.v2i2.27
Eureka: Journal of Educational Research, 2(2), 108-119

The effect of non-teacher unit costs on students' performance in KCSE examinations in public secondary schools in Kenya

James Ochieng Sika*, Fredrick Ogweno Nyawanda
Department of Education Management and Foundations, Maseno University, Kenya
*drjamessika@yahoo.com

Received: September 11, 2023
Revised: October 23, 2023
Accepted: November 22, 2023

Abstract

In Kenya, non – teacher unit cost has a bearing on academic performance. Although there are conflicting views on studies on non- teacher unit costs and its effect on academic performance, recent studies show that increases in resources have a modest positive effect on academic performance. However, it is noted that schools in Vihiga Sub-County charge twice Ministry of Education recommended fee guidelines yet the Sub-county still has the lowest KCSE (Kenya Certificate of Secondary Education) Mean Score of 5.361 (grade C-) which is below the minimum tertiary entrance. The purpose of this study was therefore to find out why students in public secondary schools in Vihiga Sub-County perform poorly in KCSE examination despite the high non- teacher unit costs. The study used ex post facto and descriptive survey design. The study population consisted of 21 head teachers and 350 teachers in 21 public secondary schools and one Sub-County Director of Education in the Sub-County. A sample of 18 head teachers and 307 teachers in 18 public secondary schools and one Sub-County Director of Education in the Sub-County were selected for the study using a saturated sampling method. Data was collected using questionnaires, document analysis and interview schedules. The findings of this research show that there is significant effect of non-teacher unit cost and on KCSE examinations in Vihiga Sub County. Hence there is need for the government to increase funding of the non-teacher aspect of education.

Keywords

Cost, education, finance, non-teacher, unit cost.

INTRODUCTION

Whether school resources for students' academic achievement matters or not, has been debated for at least 30 years, primarily with data from schools in the public sector [1]. The causal relationship between educational investment and students' academic performance continues to attract debate. Despite decades of intensive study, there is no general consensus regarding the effectiveness of monetary educational investments in students' academic achievement [2]. In particular, papers that summarize the debate on the effects of public school expenditures on students' academic achievement often advocate conflicting views. For example studies by Krueger [3] and Greenwald, Hedges, and Laine [4], are in favor of the effectiveness of public school expenditures in relation to students' academic achievement while Betts [5] and Hanushek [6], cast doubt on the effectiveness of public school expenditures on the students' academic achievement. It is therefore not yet known whether there exists a relationship

between unit costs (recurrent expenditure per academic year per student) and academic achievement in public secondary schools.

According to Raudenbush and Willms [7], structural differences across schools in the world create a variation in the unit costs and academic achievement hence a conflict. Variation in charges per school along structural differences in schools creates a conflict both in unit costs, expenditures on items and academic performance. In a study by Raudenbush [8], it was noted that high poverty schools fail in examination mean scores. In considering the effect of unit costs and academic achievement, there was a clash of opinions. The studies by Raudenbush and Willms [7] and Raudenbush [8] noted that there is a conflict of opinion between unit cost and academic achievement in schools. The study by Raudenbush [8] also noted that high poverty schools fail in examination mean scores. From these studies, there is no agreement of opinion concerning unit costs and academic achievement.

Studies carried out in Sub-Saharan Countries by Lewin [9], observed that the demand for secondary education is rising very fast in Africa; faster than for primary education and faster than any other region of the world. The study noted that there is a strong desire to become competitive in today's globalized world, so our economies will grow faster and improve the lives of our people. The study observed that the global economy of today is increasingly based on knowledge, technology and skill. The study suggests that while we continue to seek progress on primary education, we need also to increase our focus on secondary education. There is a need to expand access, improve quality and relevance, and improve equity—both between boys and girls, between urban and rural areas, between the rich and the poor, and across regions within countries. The study by Lewin [9], noted that Africa spends roughly the same percent of GDP (Gross Domestic Product) on education as the East Asian countries. But the outcomes in terms of academic performance are very different, mainly because of the disparities in the unit costs.

The Kenya government introduced 'a sector-wide approach' to education planning in 2005. This approach is known as 'The Kenya Education Sector Support Programmes 2005-2010' [10]. To ensure appropriate outcomes in KCSE examinations, teaching will be monitored and emerging issues addressed to ascertain that the prevailing unit costs achieve desired results in KCSE examinations. Kenya Education Sector Support Project (KESSP) confirmed that teaching should be monitored and emerging issues addressed to ascertain that the prevailing unit costs achieve desired results in KCSE examinations.

The expansion of the schools system in Kenya has led to the increase of the budget allocated to education. Table 1 shows the trend of recurrent expenditure as opposed to very low allocation to development.

Table 1. Education Expenditure in Kenya, 2008-2012 (Kshs. Millions)

Year	Recurrent account	Development account	Total
2008/2009	130,572.13	21,104.72	151,676.85
2009/2010	142,200.00	17,000.00	159,200.00
2010/2011	170,900.00	15,400.00	186,300.00
2011/2012	192,900.00	28,200.00	221,100.00

Source: Kenya National Central Bureau of Statistics [11].

To control recurrent expenditures, the government introduced fee guidelines for secondary schools. Government also established new staffing norms and used these to deploy the current stock of teachers to schools based on Curriculum Based Establishment (CBE) but aiming at a minimum student-teacher ratio and contact load of between 34.5-45 lessons per week.

The task force on escalating school fees report by Langat [12], recommended that the government should; legalize school fees, develop school financial management system, bursaries to be done by schools, books to be bought from orange book guided by Ministry of Education (MoE), balancing of CBE and Enrollment Based Establishment (EBE), day schools to charge Kenya shillings (Kshs.) 13,708 as opposed to current Kshs.25,374; boarding school to charge Kshs.41,574 from Kshs.54,523 and national schools to charge Kshs. 62,544 from Kshs.100,000. It can be noted from the report that the variation in fees charged in schools lead to variation in unit costs. It is not yet known whether

the variation in unit costs is the cause of the difference in academic performance in different schools across the country which is the problem of this study.

The KCSE Mean Score results of Vihiga Sub-County has been 5.361 (Grade C-) during the period, 2010-2013 as illustrated in Table 2 and Table 3.

Table 2. Vihiga County, KCSE Sub-County Mean Score, 2010-2013

Year	Vihiga Sub-County	Hamisi Sub-County	Sabatia Sub-County	Emuhaya Sub-County
2010	5.396	5.382	5.250	5.350
2011	5.874	5.230	5.345	5.360
2012	4.887	5.452	5.422	5.466
2013	5.285	5.552	5.650	5.570
Mean	5.361	5.404	5.417	5.437

Source: Vihiga County Education Day

Despite the fact that resources have been invested in the schools by the parents in the form of school fees, the KCSE performance has been below the minimum tertiary institutions' entrance of Mean Score 7 (Grade C+). According to Republic of Kenya [13], Vihiga Sub-County Director of Education pointed out that Grade "A" has been elusive for the past four years. The number of university qualifying grades was 433 in the year 2012 down from 443 in the year 2011 indicating a deviation of -10.

Table 3. Vihiga Sub-County Public Schools KCSE Mean Score, 2010-2013

School	Category	2013	2012	2011	2010
1. Vihiga high	County	7.924	6.692	6.487	6.911
2. St. Clares Girls	County	6.921	7.306	6.735	6.482
3. Mudavadi Girls	County	6.720	5.496	5.855	5.539
4. Madira Girls	County	5.882	5.737	5.016	4.933
5. Ideleri Sec.	S/County	5.284	4.390	4.635	5.471
6. Mbihi Sec.	S/County	5.208	4.131	5.154	4.617
7. Chavavo Sec.	County	5.167	4.809	5.191	5.700
8. Chango Sec.	S/County	5.134	5.378	5.610	5.980
9. Vigina Sec.	S/County	4.753	4.608	4.637	4.263
10. Womulalo Sec.	S/County	4.667	3.645	3.774	4.065

Source: Vihiga Sub-County Education/Awards Day

Furthermore, there is no available information concerning non–teacher unit costs and academic performance in the Sub-County.

Statement of the Problem

According to recent studies, resource increases have a modest positive effect on performance. However, it is noted that schools in Vihiga Sub-County charge twice the Ministry of Education Science and Technology recommended fee guideline yet the Sub-County still has the lowest KCSE Mean Score of 5.361 (Grade C-) which is below the minimum tertiary entrance. This study therefore sought to examine why students in public secondary schools in Vihiga Sub-County perform poorly in KCSE examination despite the high unit costs in non -teacher items.

Objectives of the study

The specific objective guiding this study was to establish the effect of non-teacher unit costs on students' performance in KCSE examinations in public secondary schools.

RESEARCH METHOD

Research design, area of study, study population, samples and sampling procedure, method of data analysis, are explained as follows.

Research design

The research designs chosen were ex post facto, correlation and descriptive survey. According to Fraenkel and Wallen [14], ex post facto is a systematic, empirical inquiry in which the researcher does not have direct control of the independent variable because their manifestation

has already occurred. According to Kombo and Tromp [15], descriptive surveys are a method of collecting information by interviewing or administering a question to a sample of individuals. Correlation study was used because it compares two or more different characteristics from the same group of people [16].

Area of study

This study was carried out in Vihiga Sub-County. It is one of the four Sub-Counties in Vihiga County. Vihiga County was curved out of Kakamega County in 1991. It borders Sabatia Sub-County on the North, Hamisi Sub-County to the East, Kisumu County to the South and Emuhaya Sub-County to the West. It lies between the longitudes 34° 30 and 35° 0 East and latitudes 0° and 0° 15 North [17].

Study population

The study population consisted of 21 head teachers from 21 public secondary schools in Vihiga Sub-County. The Sub-County has 28 public secondary schools. However, only 21 schools had presented candidates for KCSE examination during the period 2010-2013.

Samples and sampling procedure

A sample of 18 head teachers in 18 public secondary schools were selected using saturated sampling technique (see Table 4). Saturated sampling is a non probability sampling procedure in which all members of a target population are selected because they are too few to make a sample out of them [18]. Two schools were selected for pilot study.

Table 4. Sample Frame

Category of respondents	Study population (N)	Sample size (N)	%
Head teachers	21	18	85.71
Teachers	350	307	87.71
Sub-County Director of Education	01	01	100

Source: Sub-County Education Office, Vihiga Sub-County

Method of data analysis

Quantitative data collected from closed ended items in the questionnaires and document analysis guide was analyzed by descriptive statistics in the form of percentages and frequency tables. Inferential statistics in the form of Pearson's Product Moment Correlation was used to determine the effect of teacher unit cost, non-teacher unit costs, and school unit costs on the students' performance in KCSE examinations. Qualitative data collected by use of interview schedule was transcribed into themes and sub-categories as they emerged from the field and then tallied and presented in frequencies and percentages. The null hypothesis was tested at α=0.05 level of significance.

RESULT AND DISCUSSION

Demographic characteristics of the respondents and Non-teacher unit costs in Day and Boarding Schools are explained as follows.

Demographic characteristics of the respondents

According to the results in Table 5, the majority of the schools 11 (61.11%) were sub county schools while county schools were 7 (38.89%). Boarding & Day was 1 (5.56%), Boarding schools were 5 (27.78%) while majority 12 (66.67%) were day schools. According to Raudenbush and Willms [7], structural differences across schools in the world create a variation in the unit costs and academic achievement hence a conflict.

Table 5. Distribution of Schools by Category and Type

Category	School type			Total
	Boarding [*f* (%)]	Day [*f* (%)]	Boarding and Day [*f* (%)]	[*f* (%)]
County	5 (27.78)	2 (11.1)	0 (0.0)	7 (38.89)
Sub County	0 (0.0)	10 (55.56)	1 (5.56)	11 (61.11)
Total	5 (27.78)	12 (66.67)	1 (5.56)	18 (100.0)

Furthermore, variation in charges per school along structural differences in schools creates a conflict both in unit costs, expenditures on items and academic performance. In a study by Raudenbush [8], it was noted that high poverty schools fail in examination mean scores. From

Table 5, the majority of schools in Vihiga sub county are day schools 12 (66.67%) with less resources compared to boarding schools 7 (38.89%) with more resources. This situation probably explains why schools in the sub county perform dismally.

Table 6. School Enrolment Trend from 2010 to 2013

School Type	Schools	Enrolment			
		2010	2011	2012	2013
Boarding schools	A	420	530	539	400
	B	324	411	444	460
	C	680	637	690	695
	D	634	753	769	828
	E	1030	1030	1041	1030
	Total	3088	3361	3483	3413
	Mean	617.6	672.2	696.6	682.6
	Standard Deviation (SD)	273.6	236.8	230.5	260.5
Day schools	F	301	200	205	210
	G	443	484	543	626
	H	306	314	320	330
	I	185	229	223	232
	J	128	130	135	140
	K	301	305	310	329
	L	306	310	322	330
	M	200	102	142	131
	N	380	384	394	402
	O	412	417	420	425
	P	410	416	426	430
	Q	120	130	136	144
	Total	3492	3421	3576	3729
	Mean	291.0	285.1	298.0	310.8
	SD	111.1	127.1	132.5	148.2

Table 6 gives Student Enrolment trend from The Year 2010 to 2013 and school type. Day scholars were higher in number than boarders. But, in 2013 the number of boarders dropped as those of days scholars increased. The students' enrolments in day schools could have been higher because of the Free Day Secondary Education [11]. The high cost of boarding schools also leads to drop out rate among the learners.

Table 7. Students' Performance Index in KCSE Examination by School Type

School Type	Schools	KCSE Mean Score				
		2013	2012	2011	2010	Average
Boarding schools	A	4.33	5.032	4.798	4.058	4.554
	B	4.92	5.02	3.5	3.333	4.193
	C	5.5	5.9	5.154	4.131	5.171
	D	6.482	6.735	6.719		6.645
	E	6.911	6.487		7.924	7.107
	Mean	5.629	5.835	5.043	4.862	5.534
Day schools	F	5.378	3.748	3.03	4.09	4.062
	G	5.98	5.609	5.378	5.134	5.525
	H	4.78	5.191	4.809	5.167	4.987
	I	4.34	5.546	5.806	4.414	5.027
	J	3.21	3.25	3.63	3.094	3.296

(*continued on next page*)

Table 7. (*continued*)

School Type	Schools	KCSE Mean Score				
		2013	2012	2011	2010	Average
Day schools	K	5.471	4.697	4.390	5.284	4.961
	L	4.300	4.443	4.301	3.811	4.214
	M	4.330	4.260	4.250	3.920	4.191
	N	4.762	4.752	5.730	5.882	5.281
	O	4.520	4.873	4.485	4.448	4.581
	P	4.226	4.650	7.306	4.752	5.234
	Q	4.065	3.774	6.921	4.895	4.914
	Mean	4.639	4.594	5.071	4.634	4.735
Day & Boarding school	R	4.617	5.154	4.214	4.264	4.562
	N	18	18	18	18	
	Mean	4.901	5.070	5.143	4.706	
	SD	0.954	0.889	1.164	1.162	

Based on Table 7, boarding schools had performed better with an average KCSE mean of 5.534 (maximum = 7.107, minimum = 4.193) than Day schools with a mean of 4.735 (maximum = 5.525, minimum = 3.296). The greatest mean of 5.143 was achieved in the year 2011, followed by 5.070 in 2012, 4.901 in 2013 and lowest of 4.706 in 2010. The KCSE performance in boarding schools is better than day school probably because boarding schools charge higher fees hence higher unit costs. These findings concur with Oguntoye [19] view that proportions of boarders in schools make positive and significant contributions to examination performance when other variables are kept constant.

Non-teacher unit cost in Day and Boarding Schools

Non-teacher unit costs include the following Vote Heads in the school fees, Boarding, Equipment and Store (BES); School, Equipment and Repair (SES); Personal Emoluments (PE); Parents Teacher Association (PTA); Local Travelling and Transportation (LTT); Electricity, Water and Conservancy (EWC); Education Insurance Fund (EIF); Repairs, Maintenance and Improvement (RMI), Strengthening Mathematics and Science in Secondary Education (SMASSE); Activity, Motivation, Medical, Holiday Tuition and Contingencies.

Table 8. Comparison of Fee Payment between Day and Boarding Schools, 2010

Vote head	Boarding schools (N=5)		Day Schools (N=12)	
	Mean	SD	Mean	SD
BES	13590.0	878.9		
SES	3600.0	0.0	3600.0	0.0
PE	6360.4	891.2	3959.5	22.6
PTA	2537.3	889.8	2433.5	472.5
LTT	986.6	281.7	400.7	3.0
EWC	1940.3	162.7	504.8	19.5
Activity	882.1	200.7	567.1	46.5
RMI	752.2	130.2	400.7	3.0
Contingencies	800.0	167.5	512.0	135.1
EIF	400.0	0.0	426.6	55.8
Medical	417.9	146.1	211.4	129.2
SMASSE	200.0	0.0	270.9	228.1
Mock	973.1	68.5	901.9	284.5
Motivation	462.7	500.5	57.0	232.5
Holiday Tuition	511.9	980.0	0.0	0.0
Total	30939.3	3912.9	19061.3	4307.1

According to Table 8 respective vote heads had unit cost attached to them. The boarding schools had higher cost as opposed to day schools in relation to BES, PE, EWC, Activity, RMI, Contingencies, Mock and Holiday Tuition. The difference in terms of average mean for Boarding Schools was Ksh 30,939.3 while the day schools were Ksh. 4,307.1. This indicated that the boarding unit cost was higher than Day secondary school unit cost. The results were subjected to further analysis through the Pearson correlation coefficient to determine the elasticity and the direction of the relationship and the results are presented in Table 9.

Table 9. Pearson's Correlation between Fee Vote Head and KCSE Mean in 2010

Vote head	Boarding School (N=5)		Day School (N=12)	
	Pearson Correlation	Sig. (2-tailed)	Pearson Correlation	Sig. (2-tailed)
BES	.683*	.002	-	-
SES	.a	.	.a	.
PE	.718*	.004	.664*	.004
PTA	.356	.057	.622*	.006
LTT	.582*	.014	.668*	.004
EWC	.672*	.006	.764*	.001
Activity	.602*	.005	.546*	.023
RMI	.652*	.005	.664*	.004
Contingencies	.605*	.011	.303*	.062
EIF	.a	0.	.a	0.
Medical	.353	.068	.271	.064
SMASSE	.a	.	.a	0.
Mock	.443*	.000	.657*	.003
Motivation	.626*	.014	.702	.003
Holiday Tuition	.727*	.002	.652*	.000

Note: *= Correlation is significant at the 0.05 level (2-tailed); a= Cannot be computed because at least one of the variables is constant

According to results in Table 9, in 2010, on analyzing correlation between respective fee vote heads and KCSE in 2010 in boarding schools, BES, PE, PT, LTT, ECW, Activity, RMI, Contingencies, Medical, Mock and Motivation have positive significant correlation coefficient of r=0.683, r=0.718, r=0356, r=0.582, r=0.672. r=0.602, r=0.652, r=0.605, r=0.353, r= 0.443, r=0.626. The same trend is also seen with day schools in the same Table.

Table 10. Comparison of Fee Payment in Day and Boarding Schools in the Year 2011

Vote head	Boarding School (N=5)		Day School (N=12)	
	Mean	SD	Mean	SD
BES	14281.9	1414.5		
SES	3600.0	0.0	3745.5	179.3
PE	6371.4	895.8	3308.6	851.2
PTA	2791.0	841.4	1710.1	1137.1
LTT	1122.4	364.5	440.6	48.6
EWC	2134.3	455.4	518.1	37.6
Activity	882.1	200.7	531.0	128.9
RMI	965.7	477.6	467.2	86.6
Contingencies	829.1	193.5	458.9	129.2
EIF	427.6	44.9	343.7	126.9
Medical	456.7	162.0	277.9	254.3
SMASSE	200.0	0.0	430.4	387.2
Mock	973.1	68.5	591.8	484.8
Motivation	582.1	495.1	57.0	232.5
Holiday Tuition	511.9	980.0	26.6	123.9
Total	39014.6	5567.1	22387.6	15829.3

According to Table 10 respective vote heads had unit cost attached to them. The boarding schools had higher cost as opposed to day schools in relation to BES, PE, EWC, Activity, RMI, Contingencies, Mock and Holiday Tuition in 2011. The difference in terms of average mean for Boarding Schools was Ksh 39,014.6 while the day schools were Ksh. 22,387.6. This indicated that the boarding unit cost was higher than Day secondary school unit cost in 2011. The results were subjected to further analysis through the Pearson correlation coefficient to determine the elasticity and the direction of the relationship and the results are presented in Table 11.

Table 11. Pearson's Correlation of Fee Vote Head and KCSE Mean in 2011

Vote head	Boarding School (N=5)		Day School (N=12)	
	Pearson Correlation	Sig. (2-tailed)	Pearson Correlation	Sig. (2-tailed)
BES	.263*	.002		
SES	.[a]	.	.382*	.000
PE	.639*	.000	.402*	.000
PTA	.166	.056	.483*	000
LTT	.476*	.000	.407*	.000
EWC	.096	.271	.281*	.000
Activity	.519*	.000	.170*	.036
RMI	.042	.628	.405*	.000
Contingencies	.428*	.000	.360*	.000
EIF	.385*	.000	.413*	.000
Medical	.613*	.000	.321*	.000
SMASSE	.[a]	.	.112	.170
Mock	.616*	.000	.387*	.000
Motivation	.067	.439	.332*	.000
Holiday Tuition	.098	.261	.[c]	.000
Total			.240*	.003

Note: *= Correlation is significant at the 0.05 level (2-tailed); a= Cannot be computed because at least one of the variables is constant

According to results in Table 11, in 2011, on analyzing correlation between respective fee vote heads and KCSE in 2011 in boarding schools, BES, PE, PTA, LTT, ECW, Activity, RMI, Contingencies, EIF, Medical, Mock, Motivation and Holiday Tuition have positive significant correlation coefficient of r=0.263, r=0.639, r=0.166, r=0.476, r=0.096, r=0.519, r=0.042, r=0.428, r=0.385, r=0.613, r=0.616, r=067, r=098. The same trend is also seen with day schools in the same Table.

Table 12. A Comparison Fee payment in Day and Boarding Schools in the Year 2012

Vote head	Boarding Schools (N=5)		Day Schools (N=12)	
	Mean	SD	Mean	SD
BES	18966.1	3103.7		
SES	3963.0	579.1	3729.4	175.1
PE	6445.4	920.0	3395.9	812.4
PTA	3462.7	500.5	1781.0	1102.4
LTT	1267.9	346.6	436.2	47.5
EWC	2026.9	223.2	518.1	37.6
Activity	1137.3	464.0	546.8	161.7
RMI	868.7	291.3	458.3	82.7
Contingencies	983.7	323.7	467.7	131.8
EIF	400.0	0.0	361.4	103.3
Medical	485.7	107.9	269.0	260.3
SMASSE	200.0	0.0	394.9	369.5
Mock	973.1	68.5	636.1	474.2

(*continued on next page*)

Table 12. (*continued*)

Vote head	Boarding Schools (N=5)		Day Schools (N=12)	
	Mean	SD	Mean	SD
Motivation	776.1	752.4	76.0	265.8
Holiday Tuition	511.9	980.0	0.0	0.0
Total	45353.6	7561.0	22692.5	15809.0

According to Table 12 respective vote heads had unit cost attached to them. The boarding schools had higher cost as opposed to day schools in relation to BES, PE, EWC, Activity, R.MI, Contingencies, Mock, and Holiday Tuition in 2012. The difference in terms of average mean for Boarding Schools was Ksh 45,353.6 while the day schools were Ksh. 22,692.5. This indicated that the boarding unit cost was higher than the Day secondary school unit cost. The results were subjected to further analysis through the Pearson correlation coefficient to determine the elasticity and the direction of the relationship and the results are presented in Table 13.

Table 13. Pearson's Correlation of Fee Vote Head and KCSE Mean in 2012

Vote head	Boarding Schools (N=5)		Day Schools (N=12)	
	Pearson Correlation	Sig. (2-tailed)	Pearson Correlation	Sig. (2-tailed)
BES	.896*	.000		
SES	.272*	.001		
PE	.838*	.000	.343*	.000
PTA	.560*	.000	.428*	.000
LTT	.938*	.000	.333*	.000
EWC	.692*	.000	.291*	.000
Activity	.522*	.000	.091	.253
RMI	.434*	.000	.348*	.000
Contingencies	.635*	.000	.448*	.000
EIF	.b	.	.341*	.000
Medical	.658*	.000	.053	.505
SMASSE	.b	.	.047	.559
Mock	.410*	.000	.296*	.000
Motivation	.070	.420	.466*	.000
Holiday Tuition	.115	.184	.c	.
Total			.121	129

Note: *= Correlation is significant at the 0.05 level (2-tailed); a= Cannot be computed because at least one of the variables is constant.

According to results in Table 13, in 2012, on analyzing correlation between respective fee vote heads and KCSE in 2012 in boarding schools, BES, PE, PTA, LTT, ECW, Activity, RMI, Contingencies, EIF, Medical, Mock, Motivation and Holiday Tuition have positive significant correlation coefficient of r= 0.896, r=0.272, r=0.560, r=0.938, r=0.692, r=0.522, r=0.434, r=0.635, r=0.658, r= 0.410, r=0.070, r=0.115. The same trend is also seen with day schools in the same Table.

Table 14. A comparison of Fee Payment of Day and Boarding Schools in the Year 2012

Vote head	Boarding Schools (N=5)		Day Schools (N=12)	
	Mean	SD	Mean	SD
BES	20259.0	2851.7		
SES	4181.3	927.5	7261.0	15498.7
PE	6493.1	990.2	3099.1	1157.8
PTA	3141.8	692.6	1684.1	1262.7
LTT	1267.9	346.6	499.5	389.3

(*continued on next page*)

Table 14. (*continued*)

Vote head	Boarding Schools (N=5)		Day Schools (N=12)	
	Mean	SD	Mean	SD
EWC	2026.9	223.2	477.6	139.0
Activity	1289.6	540.7	499.4	211.2
RMI	925.4	291.9	441.9	148.3
Contingencies	1013.4	362.9	427.2	176.5
EIF	426.1	35.1	332.3	136.5
Medical	655.9	236.5	248.1	268.9
SMASSE	200.0	0.0	392.4	377.6
Mock	1000.0	0.0	520.9	483.6
Motivation	970.2	1096.4	57.0	232.5
Holiday Tuition	511.9	980.0	0.0	0.0
Total	47696.7	7944.5	21840.9	19867.9

According to Table 14 respective vote heads had unit cost attached to them. The boarding schools had higher cost as opposed to day schools in relation to BES, PE, EWC, Activity fees, RMI, Contingencies, Mock, and Holiday Tuition. The difference in terms of average mean for Boarding Schools was Ksh 47,696.7 while the day schools were Ksh. 21,840.9. This indicated that the boarding unit cost was higher than the Day secondary school unit cost. The results were subjected to further analysis through the Pearson correlation coefficient to determine the elasticity and the direction of the relationship and the results are presented in Table 15.

Table 15. Pearson's Correlation of Fee Vote Head and KCSE Mean in 2013

Vote head	Boarding Schools (N=5)		Day Schools (N=12)	
	Pearson Correlation	Sig. (2-tailed)	Pearson Correlation	Sig. (2-tailed)
BES	.898*	.000		
SES	.b	.	.b	.
PE	.696*	.000	.125	.117
PTA	.131	.132	.475*	.000
LTT	.926*	.000	.172*	.031
EWC	.646*	.000	.430*	.000
Activity	.794*	.000	.008	.919
RMI	.457*	.000	.596*	.000
Contingencies	.899*	.000	.085	.290
EIF	.278*	.001	.211*	.008
Medical	.892*	.000	.442*	.000
SMASSE	.b	.	.b	.
Mock	.b	.	.454*	.000
Motivation	.322*	.000	.005	.955
Holiday Tuition	.137	.116	.c	.
Total	.863*	.000		

Note: *= Correlation is significant at the 0.05 level (2-tailed); a= Cannot be computed because at least one of the variables is constant.

According to results in Table 15, in 2013, on analyzing correlation between respective fee vote heads and KCSE in 2013 in boarding schools, BES, PE, PTA, LTT, ECW, Activity, RMI, Contingencies, EIF, Medical, Mock, Motivation and Holiday Tuition have positive significant correlation coefficient of r=0.898, r=0.696, r=0.131, r=0.926, r=0.646, r=0.794, r=0.457, r=0.899, r=0.278, r=0.892, r=0.322, r=137, r=863. The same trend is also seen with day schools in the same table.

In all the above categories of schools, there is a positive correlation between non–teacher unit cost and student performance in KCSE examinations. Non–teacher unit cost is a measure of the unit expenditure per student per year. The results show that as the non-teacher unit cost increases, KCSE mean score increases.

These results agree with Bray [20], who noted that some countries' expenditures in education produces education with good quality (albeit always with room for improvement), while in other countries quality is very low. The latter again indicates gaps that need more financing and/or more efficient use of existing resources. Education in economic development is an investment in human capital.

This research finding also agrees with Krueger [3] and Greenwald et al. [4] who posits that effectiveness of public school expenditures has a positive effect on performance. These findings concur with Sika [21] view that sub county schools experience financial deficit while county schools experience financial surplus. The study concluded that schools with surplus income perform better than schools with financial deficits.

In Vihiga Sub County, however, the unit cost is high yet performance in KCSE remains low 5.361 (Grade C-). Krueger [3] and Greenwald et al. [4] posits that the effectiveness of public school expenditures has a positive effect on performance. It's possible that the low performance in the county could be due to lack of effectiveness of public school expenditures.

Some five head teachers of county schools 5 (27.78%) were interviewed to determine the financial status of the schools, use of money to improve the results and availability of resources in the schools. It was found out that in the schools, the fee payment was described by the Head teachers as 'very good'. The money was used to motivate teachers, sponsor academic trips, benchmarking to other high performing schools, carrying out joint exams, buying textbooks, photo printers, equipment and computers. The KCSE Mean Score in the schools was 5.534 (grade C) in 2010-2013.

Some twelve head teachers of day schools 12 (66.67%) were also interviewed. The results indicated that in the schools, student school fees were the main source of revenue. The head teachers of the day schools described fee payment as 'very poor'. In the schools, the textbook to student ratio was 1:7, the schools each had only one laboratory to cater for Biology, Chemistry & Physics. It was also indicated that students "disappear" when sent home to bring school fees. The head teachers described the KCSE results in 2010-2013 as a poor 4.735 (Grade C-) because of financial struggles. These findings concur with Sika [21], who observed that the majority of County Schools experienced financial surplus. The study concluded that schools with surplus income perform better than schools with financial deficits. A study by Nyaoga [22], observed that some schools spend highly hence high performance.

CONCLUSION

The findings indicated that there is a significant effect of non-teacher unit costs on students' performance in KCSE examinations in public secondary schools in Vihiga Sub-County.

This study recommends MoE to closely monitor strict adherence to School fee policy as established by the government in order to regulate the school fees charged in public secondary schools. The MoE should strictly monitor school fees increases so as to check on arbitrary increases and excess by school authorities. The MoE should ensure that recurrent expenditures are controlled by applying proper accounting discipline and necessary auditing procedures in order to monitor school funds.

REFERENCES

[1] K. Graddy and M. Stevens, "The Impact of School Resources on Student Performance: A Study of Private Schools in the United Kingdom," *ILR Rev.*, vol. 58, no. 3, pp. 435–451, Apr. 2005.

[2] C. Kang, "Does money matter? The effect of private educational expenditures on academic performance," Singapore, 0704, 2007.

[3] A. B. Krueger, "Economic Considerations and Class Size," *Econ. J.*, vol. 113, no. 485, pp. F34–F63, Feb. 2003.

[4] R. Greenwald, L. V Hedges, and R. D. Laine, "The Effect of School Resources on Student Achievement," *Rev. Educ. Res.*, vol. 66, no. 3, pp. 361–396, Sep. 1996.

[5] J. R. Betts, "Is there a link between school inputs and earnings? Fresh scrutiny of an old liter- ature," in *Does Money Matter? The Effect of School Resources on Student Achievement and Adult Success*, G. Burtless, Ed. Washington, DC: Brookings Institution Press, 1996, pp. 141–191.

[6] E. A. Hanushek, "The Failure of Input-based Schooling Policies," *Econ. J.*, vol. 113, no. 485, pp. F64–F98,

Feb. 2003.
[7] S. W. Raudenbush and D. Willms, "The Estimation of School Effects," *J. Educ. Behav. Stat.*, vol. 20, no. 4, pp. 307–333, 1995.
[8] S. W. Raudenbush, *Schooling, Statistics, and Poverty: Can We Measure School Improvement?*. Princeton, NJ: Educational Testing Service, 2004.
[9] K. M. Lewin, *Strategies for sustainable financing of secondary education in Sub-Saharan Africa*, vol. 136. Washington DC: World Bank Publications, 2008.
[10] Republic of Kenya, *Kenya Education Sector Support Programme 2005-2010: Delivering Quality Education and Training to All Kenyans*. Nairobi: Government Printer, 2005.
[11] Kenya National Bureau of Statistics, *Kenya Facts and Figures 2012*. Nairobi: Kenya National Bureau of Statistics, 2012.
[12] A. Langat, "Kenya: Taskforce to Probe Escalating School Fees," *cajnewsAFRICA*, 18-Feb-2014.
[13] Republic of Kenya, *Vihiga Sub-County Education/Awards Day, 2013*. Nairobi: Government Printer, 2013.
[14] J. R. Fraenkel, N. E. Wallen, and H. H. Hyun, *How to design and evaluate research in education*. New York: McGraw-hill, 2012.
[15] D. K. Kombo and D. L. A. Tromp, "Proposal and thesis writing: An introduction," *Nairobi Paulines Publ. Africa*, vol. 5, no. 1, pp. 814–830, 2006.
[16] R. Kumar, *Research methodology: A step-by-step guide for beginners*. New Delhi: Pearson Education Publishers.
[17] S. M. Mikalitsa, "Intrahousehold allocation, household headship and nutrition of under-fives: a study of western Kenya," *African J. Food, Agric. Nutr. Dev.*, vol. 15, no. 68, pp. 9708–9721, Feb. 2015.
[18] L. Cohen, L. Monion, and K. Morris, *Research methods in education*, 5th ed. London, UK: Croom Helm, 2000.
[19] A. O. O. Oguntoye, "Cost and Production Functions in Education: An Economic Analysis of Secondary Education in Ogun State of Nigeria," University of Wisconsin, 1978.
[20] T. M. Bray, *The costs and financing of education: Trends and policy implications*. Asian Development Bank & CERC, 2002.
[21] J. O. Sika, "The Relationship between Recurrent Expenditure and Performance in Secondary Schools in Siaya District, Kenya," Maseno University, 2003.
[22] O. M. Nyaoga, "Factors that Influence Performance in Public Examinations in Kisii District," Maseno University, 2003.