Selected educational resources as determinants of academic performance in public secondary schools in Kuria East and Kuria West sub-counties, Kenya

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ABSTRACT

The constitution of Kenya commits to providing Kenyan youths with access to quality education. Kenya has committed to achieve goal four of the global Sustainable Development Goals (SDGs) which aims to provide inclusive, equitable and quality education and promote lifelong learning opportunities for all by the year 2030. An analysis of Kenya Certificate of Secondary Education performance in Migori County showed that Kuria East and Kuria west sub-counties are always at the bottom of the seven sub-counties with continually declining academic performance from 2012 to date. This study sought to determine the influence of the levels of adequacy and utilization of teachers on learners' academic performance in Kuria East and Kuria West sub-counties. The objectives of the study were: to determine the influence of the levels of adequacy of teachers on learners academic performance in Kuria East and Kuria West sub-counties; to establish the influence of the level of utilization of teachers on learners' academic performance in Kuria East and Kuria West sub-counties. The study adopted a descriptive survey research design. The population consisted of 40 principals and 345 teachers. Saturated random sampling technique was used to select 36 principals while stratified random sampling was used to select 138 teachers for the study. Data was collected through questionnaires, document analysis guide and observation checklist. Face and content validity of the instruments was ascertained by supervisors. Quantitative data was analyzed using both descriptive and inferential statistics involving percentages, mean and linear regression and qualitative data using content analysis. Findings indicated that adequacy and utilization of selected educational resources had statistically significant effect on academic performance with a regression coefficient of 0.87 for teachers. The government should employ more teachers to bridge the gap of over 60.58% teacher shortage in Kuria East and 50.1% shortage in Kuria West and ensure that those who are already employed are not overworked. Findings of the study may be useful to Kuria East and Kuria West sub counties, county government of Migori, Teachers Service Commission, educational planners, policy makers, and educational managers to utilize educational resources efficiently and device measures to address shortages of educational resources in schools so as to improve academic performance and to academicians for research purposes.

Keywords: Educational resources, academic performance, teacher utilization, teacher adequacy, efficiency.

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INTRODUCTION

Under the Bill of Rights in the Kenyan Constitution (2010), free and compulsory basic education is guaranteed to all children, including vulnerable children and children with disabilities. The constitution also commits to providing Kenyan youth with access to quality education. Kenya's Vision 2030, the government's blue

print for long-term development, affirms Kenya's aim to transform the country into a middle – income economy providing high quality of life for all its citizens by the year 2030. In addition, Kenya has committed to achieve the global Sustainable Development Goals (SDGs) by the year 2030 (Republic of Kenya, 2007). Goal four of the SDGs is quality education which aims to provide inclusive, equitable and quality education and promote lifelong learning opportunities for all. The quality of education imparted to Kenyan children and youth are, and would remain, the determining factor in the achievement of Kenya's Vision 2030. Investing in human capital is the sure means for Kenya to achieve her economic, social and political objectives well-articulated in Vision 2030 and the constitution (Orodho, 2014).

Despite the progress made in enhancing enrolment at all levels of education, there remain challenges that hinder Kenya from reaping maximum benefits of the large investments made in the sector, which stands at close to 7% of the annual GDP (Republic of Kenya, 2015). One of the challenges is low quality of education outcomes. An analysis of students' 2016 performance on the Kenya Certificate of Secondary Education (KCSE) examinations indicates that most learners achieved below average scores with 33000 learners' attaining E grade in KCSE of which Kuria East and Kuria West had 200 Es which represents about 7% of the total number of candidates in Kuria East and Kuria West Sub-Counties with the grade (Kenya National Examination Council (KNEC) Report, 2016).This was a very significant percentage since there are over 300 sub counties in Kenya with only two contributing over 7% of the total number of candidates with the lowest grade. Further analysis of KCSE performance in Migori County shows that Kuria East and Kuria West sub-counties have been at the bottom of the seven sub counties in the county for a number of years as indicated in Table 1.

The data in the table indicates that the mean score in performance in KCSE have dropped from 4.82 to 3.13 in Kuria West and 4.70 to 3.05 in Kuria East between 2012 and 2016. This is below the expected maximum score of 12.00. These were also the lowest mean scores in Migori County.

The Organization for Economic Co-operation and Development (OECD) Programme for International Student Assessment (PISA) shows that resource shortages hinder instruction and lower student performance (OECD, 2007). In some education systems, there are concerns that schools not only lack the resources to meet the educational requirements of their students, but that schools may have fewer resources with which to provide instruction to their students (OECD, 2008).

A survey report conducted by KNEC, 2017 in Kenya titled National Assessment System for Monitoring Learner Achievement (NASMLA) on what causes poor performance in KCPE and KCSE identified factors that

causes poor results as lack of regular meals, textbook sharing, and school entry age, lack of facilities, absenteeism by teachers, irregular assessment and professional qualifications of teachers among others.

A preliminary survey by the researcher in February 2017 on the allocation of teachers, who process all the education inputs in order to achieve a desirable output revealed that out of the seven sub-counties Kuria East and Kuria West had the lowest student teacher ratio as shown in Table 2.

Table 2 compared with Table 1 presents a sharp contrast on the levels of adequacy of teachers and academic performance. This is because Kuria East and Kuria West sub counties had the best student to teacher ratios of 42:1 and 43:1 respectively compared to other neighbouring sub counties that had over 45:1 from 2012-2016. Despite this the two sub-counties posted the lowest and continually declining academic performance. Therefore, this study sought to determine the influence of levels of adequacy and utilization of teachers on learners' academic performance in Kuria East and Kuria West sub counties.

Statement of the problem

There had been low and declining academic performance in public secondary schools in Kuria East and Kuria West Sub Counties over the years. This was despite the fact that the government invested heavily in education, for example, in 2016/2017 financial year; secondary schools were allocated 32 billion for FDSE in which Kuria East and Kuria West benefited (Republic of Kenya, 2015) to ensure that resources required in schools are availed. Moreover, the government had continuously over the years employed more teachers in public secondary schools in which Kuria East and Kuria West are also beneficiaries but the academic performance continued to decline in Kuria East and Kuria West over the years compared to other neighboring sub counties. This study therefore sought to determine the influence of selected educational resources as determinants of learners' academic performance in Kuria East and Kuria West Sub Counties with a view to addressing low academic performance of public mixed secondary schools in the said sub counties

Objectives of the study

The objectives of the study were:

1. To determine the influence of the levels of adequacy and utilization of teachers on learners' academic performance in Kuria East and Kuria West sub counties.
2. To establish the influence of the levels of utilization of teachers on learners' academic performance in Kuria

Table 1. Migori County KCSE result analysis from 2012 to 2016.

Year Subcounty	2012	2013	2014	2015	2016
Rongo	6.26	7.01	5.33	5.60	3.77
Awendo	5.01	5.62	5.49	5.23	3.56
Uriri	4.92	4.89	5.21	5.25	3.56
Nyatike	5.27	5.52	5.30	5.26	3.94
Migori	5.60	5.15	5.14	4.97	3.28
Kuria West	4.82	4.75	4.63	4.58	3.13
Kuria East	4.70	4.61	4.60	4.51	3.05

Source: Migori county TSC statistics office.

Table 2. Migori County staffing and enrolment levels as at February 2017.

Sub-county	Number of schools	Teachers		Enrolment	Streams	S/T ratio
		On duty	Shortage			
Uriri	33	193	329	9440	241	48:1
Migori	53	341	611	17060	431	50:1
Rongo	28	258	317	11696	284	45:1
Awendo	38	230	378	10673	282	46:1
Nyatike	53	240	427	10817	241	45:1
Kuria West	32	219	246	9233	229	43:1
Kuria East	20	126	153	5226	128	42:1

Source: Migori County TSC Statistics Office. Key: S/T Ratio – Student/Teacher Ratio.

East and Kuria West sub-counties.

LITERATURE REVIEW

Teachers are the people who constitute the staff workforce in a school. According to Olagboye (2004), people and knowledge, skills and attitudes in them constitute resources. Okwori (2006) agreed with this assertion and added that expertise in technical, mechanical, managerial, social and other areas potentially available for utilization in social and economic institutions constitute human resources.

Teachers in secondary schools are engaged in the processing of all educational inputs, students inclusive, so that the educational institutions may be able to achieve their objectives. They disseminate knowledge and skills through teaching, contribute to advancement in knowledge and engage in community services. Their adequacy and utilization would determine the success or failure of the educational system.

Teachers constitute the core of the education system and their importance in student performance has been widely confirmed by many studies (Rivkin et al., 2000). Thus, teachers are an important resource in the teaching and learning process and their training and utilization therefore requires critical consideration (Republic of Kenya, 2005a). In recent years an increasing number of studies have expressed concern about current and prospective teacher shortages in many countries. Severe shortages currently exist, and there is a gap between demand and supply of teachers needed to ensure effective teaching in many countries. Teacher shortages have therefore, become a major concern to educational authorities and should be addressed continuously by policy makers.

A method of determining the extent of teacher's utilization was through the number of students assigned to them for teaching. These are referred to as Students-Teacher Ratio (STR). STR was used to determine the number of students that were allocated to a teacher in a given educational level. The STR shows a teachers workload at a particular level of education. It also helps in determining the number of teaching manpower needed for a projected student's enrolment. Thus, it could be used to determine whether teachers are over-utilized or underutilized (Afolabi, 2005).

$$STR = \frac{\text{Total number of students at a given educational level in a year}}{\text{Total number of teachers at a given educational level in a year}}$$

This ratio sometimes might not accurately indicate teacher shortage in secondary schools since there are so many subjects offered and those subjects' calls for different teachers with different subject combinations. To

ascertain adequacy of teachers in schools, STR and subject combinations should be considered as required by Curriculum Based Establishment (CBE).

Odhiambo (2010) contends that there was a growing demand from the Kenyan government and the public for teacher accountability in students' performance. Schools are commonly evaluated using students' performance and teachers cannot be disassociated from the schools they teach and academic results of the students. Teachers celebrate and are rewarded when their schools and subjects are highly ranked.

Researches have shown that educators qualifications have serious implications for the quality of the education they provide (Fenech, 2006). Well trained teachers are expected to hold their jobs longer, to be able to engage in more responsive, positive and consistent interaction with students, and to positively influence students' performance.

Musili (2015) points out that teacher's professional experience influence students' performance in KCSE. This shows that experienced teachers are more satisfied when they have challenging opportunities at work and are better placed to handle them and commit their time to teaching their students for improved performance. This study sought to evaluate the adequacy and utilization of well trained and experienced teachers and their influence on students' performance in KCSE in public secondary schools in Kuria East and West Sub Counties.

A study carried out by Lynn (2014), on influence of Kenya vision 2030's Education policy on quality Education in public secondary school indicated that, good performance depends on students' intelligence quotient and hard work since some students perform above average in schools where resources are scarce. It has been documented that many interacting factors may cause the poor performance of students in KCSE. Students' characteristics such as students age, student career choice, gender, study times and class attendance being among the factors (Ogweno, 2014). In another study by Al-Hilawani and Sartawi (1997), it was also found that good study skills and habits are fundamental for student's academic performance.

Conceptual framework

This study was based on a hypothesized relationship between a set of variables as diagrammatically explained in Figure 1.

Figure 1 illustrates the educational resources namely; teachers in terms of their number and workload, and their influence on academic performance, which was the dependent variable. The intervening variables which might also have had effects on academic performance included but not limited to student attitude, teachers academic qualification, teaching experience, administrative style and socio-economic and cultural

background. This study focused on the teachers since they were the ones who were responsible for the processing of all the educational inputs. Further, they are at the center of learning since they disseminate knowledge to the learners and mobilize and use other educational resources to ensure success of any educational system. Teachers' adequacy and utilization was indicated by the number of teachers in relation to CBE and their workload.

RESEARCH METHODOLOGY

This study adopted ex-post facto and descriptive survey research designs. As a result of the cause-and-effect relationships, this research design does not permit manipulation of the variables (Patton, 2002). Therefore the independent variables were studied after they had already exerted their effect on the dependent variable. The study was carried out in Kuria which was constituted by Kuria East and Kuria West Sub Counties of Migori County. The researcher targeted 40 principals and 345 teachers from 40 public mixed secondary schools.

The study's sample size was determined using the Bell (2005) rule of thumb which suggests that at least a third of the total population was sufficient for representativeness in a social study. In this study, the principal for each school (90% of the population) and teachers randomly chosen from each of the schools sampled were the respondents in this study. A total of 36 principals were sampled for the study after 4 principals had been used for piloting. This was because principals were the administrators of these institutions therefore possessed all the information about the school they administered and were custodians of all the resources in a school. The other teachers were to complement the data that might have not been given by the principal for objectivity purposes.

To ensure fair representation of teachers for the study, stratified random sampling was used in selecting and distributing 138 teachers. The stratification factors were day in, day and boarding. Due to possibilities of non-responses, the study targeted a participation scale of 138 teachers from 36 schools, which was 40% of the total population as illustrated in Table 3. 40% of the teachers in each of the 36 schools were randomly chosen for the study which summed to 138 teachers.

This study used questionnaires to gather information from principals, teachers, and observation checklist and document analysis guide. Questionnaires were recommended because the data gathered allowed measurement for and against a particular view point. Questionnaires were also considered ideal for collecting data from Head teachers and teachers because they could individually read, interpret and fill them. They allowed information to be collected from a large number of respondents within a short time and ensure anonymity
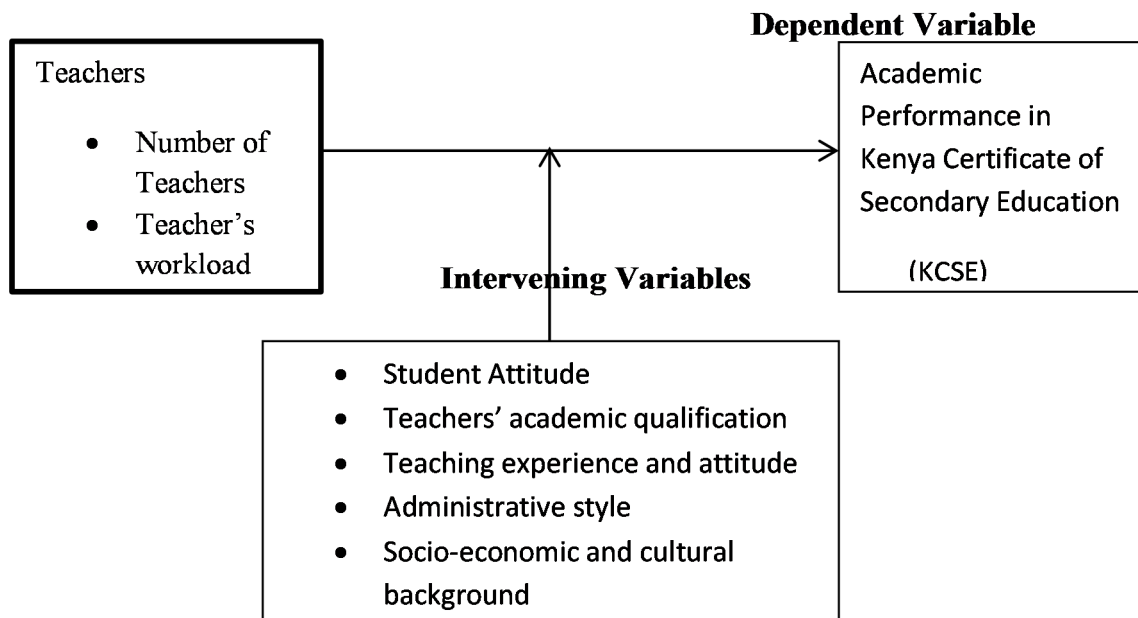
Independent variables

Figure 1. Relationship between the dependent and independent variables.

Table 3. Adequacy of teachers.

Sub-county	Teachers					
	TSC	BOM	Volunteer	CBE	Shortage	% Adequacy
Kuria West	232	121	17	465	233	49.90
Kuria East	136	85	5	345	209	39.42

and also eliminated interviewer's bias (Orodho, 2009). Both open-ended and closed-ended questions were used. The study employed two different sets of questionnaires for both principals and teachers.

Face and content validity of the instruments was determined by experts in planning and economics of education and their inputs were considered in making the necessary revisions on the final version of the instruments that were used to collect data. A pilot study involving four public mixed schools which represented 10% of the population was done to ascertain the reliability of the instruments and the weaknesses noted were corrected to make the instruments more reliable.

Conversion of data into meaningful information was undertaken on two dimensions, one involving quantitative/metric data (nominal, ordinal and interval forms of data) and the other involving qualitative/non-metric data (textual open-ended data). The refined and organized quantitative data was analyzed using descriptive and inferential statistics involving percentages, mean scores and regression analysis to determine varying degrees of response-concentration. According to Hair et al. (2010), this statistical approach was essential when finding a way of condensing the information contained in a number of original variables into a smaller set of factors with a minimum loss of information. The statistics was generated with aid of the computer software, Statistical Package for Social Sciences (SPSS) Version 20.0.

The study's non-metric, open-ended responses were analyzed using content analysis procedure, whereby the pool of diverse responses was reduced to a handful of key issues in a reliable manner. This was achieved through a stepwise process that involved two broad phases: firstly, taking each person's response in turn and marking in them any distinct content elements, substantive statements or key points; and secondly, forming broader categories to describe the content of the response in a way that allowed for comparisons with other responses. The categories obtained in second phase was numerically coded and then entered into the data file to be treated as quantitative data.

DATA ANALYSIS, PRESENTATION AND DISCUSSION

Levels of adequacy of teachers

The study sought to assess the number of teachers in public mixed secondary schools in Kuria East and Kuria West sub counties and the results are indicated in Table 3.

Table 3 indicates that in Kuria West, 232 teachers were employed by TSC, 121 by BOM and 17 volunteers. In Kuria East 136 teachers were employed by TSC, 85 by BOM and 5 volunteers. It also indicates that there is a shortage of 233 teachers and 209 teachers in Kuria West and Kuria East respectively. This represented 49.90 and 39.42% levels of teacher adequacy against the CBE.

Influence of adequacy of teachers on school mean academic performance in KCSE

The schools mean scores in KCSE provided by the principals were analyzed by averaging the school mean scores for the years 2015, 2016 and 2017. The data obtained was regressed against percentage adequacy of teachers. The provisions of CBE indicates that a single stream should have at least 11 teachers, double stream 19 teachers, 3 streams 27 teachers and four streams 35 teachers. The levels of adequacy of teachers per school were measured by working out the percentage of teachers on duty against the optimal number of teachers that should be employed in that school as provided by the CBE. Using the stated data, the regression model and the scatterplot obtained are indicated in Figure 2.

It was established that there was a positive relationship with a regression coefficient of 5.953 between schools mean scores in KCSE examination and the level of adequacy of teachers in schools. This was because a line of best fit could be drawn across the scatter points except for a few outliers. This result points to probable positive dividends for students and schools that could be reaped from adequate supply of teachers to schools.

Table 4 shows the regression model of influence of teacher adequacy on student performance measured in terms of school mean score in KCSE.

The model shows that the levels of adequacy of teachers in schools influences performance with a regression coefficient and it is statistically significant with a Pearson's correlation of 0.86 at sig 0.000 against the test value of 0.05.

Levels of adequacy of teachers exhibited a positive trend with school mean performance in KCSE. These findings concurred with those of OECD (2008), Pal (2000) and a survey conducted by KNEC in 2017 which found out that teacher shortage hinder instructions and lower student performance.

Optimal staffing in schools is a factor of student enrolment, number of subjects and subject combinations, number of hours taught per week, number of streams and teacher involvement in administrative and other extracurricular assignments. These should be taken into account when using the standard student - teacher ratio (STR) for determining school staffing levels. While the Government puts priority on the wage bill as a major factor, teachers, through Kenya National Union of Teachers (KNUT) and the school principals, lay strong emphasis on the teacher welfare and workload in arguing their case for increased staffing. Both sides of the argument need to be considered in settling this debate.
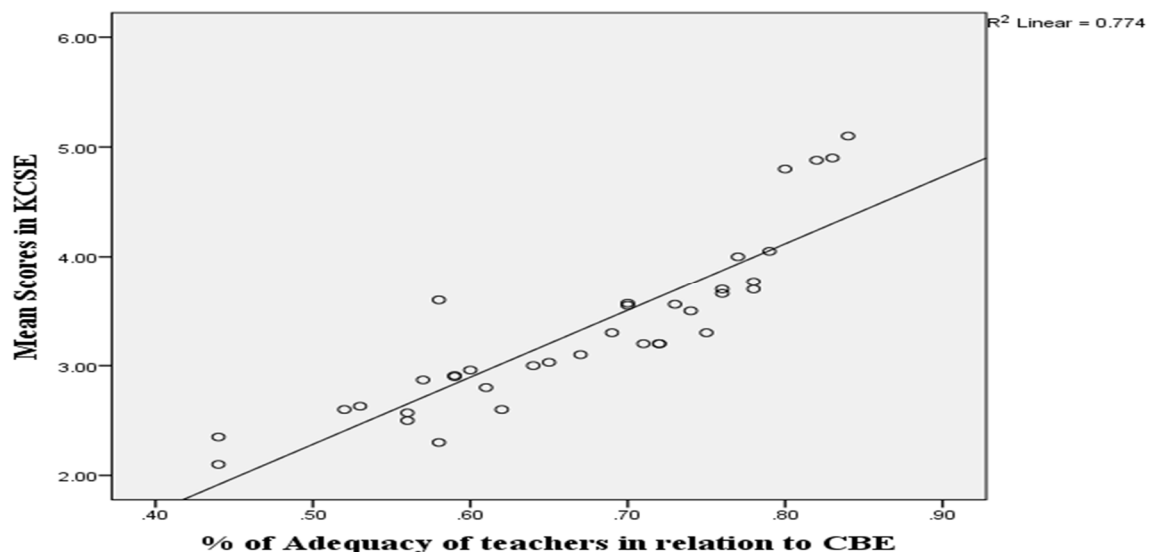

Figure 2. Relationship between school mean scores in KCSE and the levels of adequacy of teachers.

Table 4. Regression model showing influence of adequacy of teachers on school mean Performance in KCSE.

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	**Std. Error**	**Beta**		
(Constant)	-.693	.412		-1.683	.102
% of Adequacy of teachers in relation to CBE	5.953	.605	.860	9.847	.000

a. Dependent Variable: Mean Scores in KCSE.

Teacher utilization

Number of lessons taught per week

The study investigated the level of utilization of teachers in terms of the number of lessons taught per week by working out the average number of lessons taught by a teacher per week obtained from class attendance register and the results are indicated in Table 5.

Table 5 reveals that teachers taught up to a maximum of 38 lessons per week in a given school while others taught 27 lessons per week. This presented a large range of 11 lessons between the highest and lowest number of lessons by a teacher per week. With an average of 32 lessons per week against an optimum number of 27 lessons, the teachers are overworked. In Kenya, weaknesses in human resource planning has affected training and deployment of teachers and thus distorted their distribution and utilization. Consequently, there exists an unbalanced distribution of teachers, teacher shortages, teacher surplus and inefficient utilization of teachers (Republic of Kenya, 2005b). This could be an indication of the absence of a framework in determining the demand for teachers. Most teachers prefer to work in urban, peri-urban and high potential areas where social amenities are available (Republic of Kenya, 2005a). Thus, the current policy of recruiting teachers where vacancies exist is aimed at redressing the uneven distribution of teachers. According to the TSC guidelines, the optimal number of lessons a teacher should teach in a week is 27 lessons but the table indicate that on average a teacher handled 32 lessons in a week in Public mixed secondary schools in Kuria East and Kuria West sub-counties an indicator that the current redeployment or recruitment policy has not wholly solved the problem since the teachers in this part of Kenya were over utilized.

Influence of utilization of teachers on school mean academic performance in KCSE

Teacher utilization was arrived at by working out the average number of lessons taught by a teacher per week in each school sampled which was then regressed against KCSE academic performance for each school as shown in Figure 3.

Table 6 indicates the regression model for influence of teacher utilization on school mean performance. It was established that there was a negative relationship between school mean scores in KCSE examination and the number of lessons taught by a teacher per week. This was because as the number of lessons increased the academic performance decreased. The model shows that the levels of utilization of teachers in schools influence performance negatively with a regression coefficient of -0.151 with a Pearson's correlation coefficient of -0.637.

Levels of utilization of teachers exhibited a negative trend with school mean performance in KCSE. These findings concurred with those of Afolabi (2005), Olendo (2008) and a survey conducted by KNEC in 2017 which found out that when teachers are over utilized, academic results is likely to decline. Since June 2003, the Teachers Service Commission (TSC) has been carrying out a balancing exercise to move teachers from overstaffed areas to understaffed areas but this exercise has faced major resistance (Republic of Kenya, 2005a). Teachers are reluctant to move from their already established stations to remote areas, places considered hardship areas or from rural to urban or vice versa. For this reason, hardship and remote areas continue to suffer teacher shortages. Alternative modes of deployment for appropriate utilization of teachers, therefore, need to be explored and implemented. Some scholars have recommended that the monopoly given to the TSC be dismantled and allow the formation of efficient and independent employment boards to deal with teachers recruitment, promotion and terms of service. Such a move would make teaching profession more efficient (Abagi and Olweya, 1999) and responsive to the demands of the dynamic education system.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The study revealed that there was a significant positive relationship between adequacy of teachers and academic performance with a regression coefficient of 5.953 as indicated in Table 4. It was found out that the more the number of teachers in schools the better the academic performance. The study also revealed that there was a

Table 5. Average number of lessons taught by a teacher per week.

Sample	Number of lessons	Sample	Number of lessons
1	34	19	28
2	26	20	33
3	30	21	30
4	30	22	34
5	27	23	33
6	38	24	32
7	28	25	35
8	32	26	37
9	33	27	28
10	28	28	29
11	28	29	29
12	32	30	31
13	34	31	35
14	36	32	34
15	37	33	35
16	30	34	29
17	33	35	30
18	31	36	35
		Average	**32**
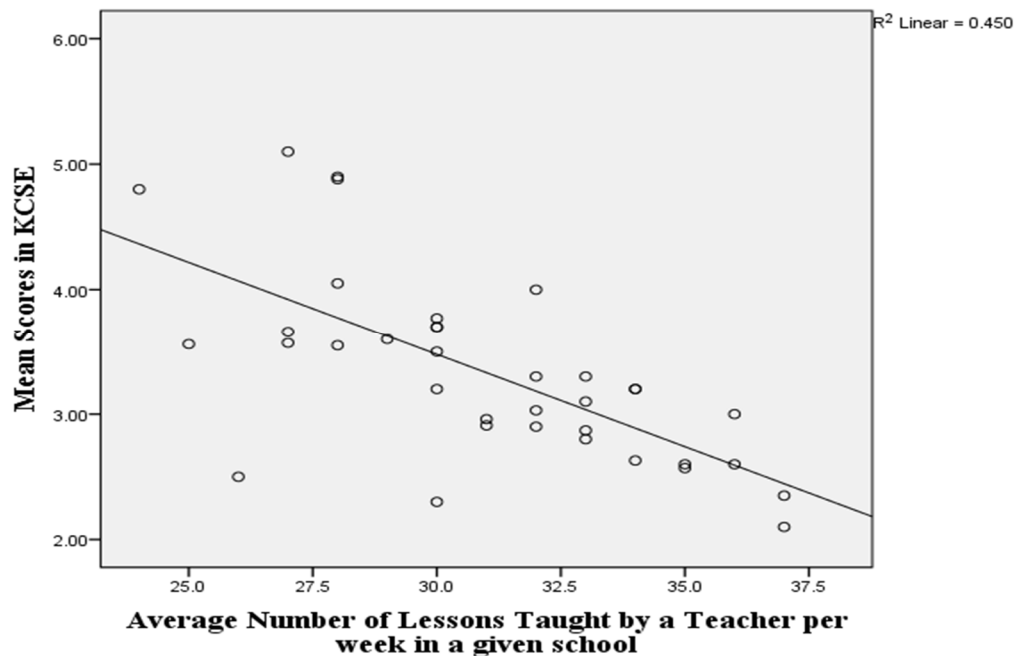
Figure 3. Relationship between school mean scores in KCSE and the levels of utilization of teachers.

shortage of 209 (60.58%) teachers in secondary schools of Kuria East and 233(50.1%) teachers in Kuria West sub counties according to the provisions of Curriculum Based Establishments (CBE) as illustrated in Table 3. This high level of teacher shortage coupled with low retention rate led to low academic performance in the said region.

Levels of utilization of teachers and its influence on academic performance was analyzed through establishing the number of lessons taught by a teacher per week then regression coefficient against academic

Table 6. Regression model showing influence of utilization of teachers on school mean performance in KCSE.

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	8.102	.998		8.122	.000
Number of lessons taught by a teacher per week	-.151	.031	-.637	-4.823	.000

a. Dependent Variable: Mean Scores in KCSE

performance worked out through the help of SPSS. It was established that on average, teachers taught different number of lessons in different departments. Sciences and Mathematics Department had the highest number of lessons taught per week at 29 lessons per teacher followed by Languages at 28 lessons, Technical and Applied at 27 and the least was humanities at 26 lessons per week. On average a teacher handles 32 lessons per week across the departments. This exceeds the optimal number that should be handled by a teacher which should be a maximum of 27 lessons per week. Apart from teaching, teachers also had various responsibilities with some having up to four responsibilities including class teacher, head of department, deputy principal, games teacher and boarding teacher. Thus, there was a negative relationship between utilization of teachers against academic performance with a regression coefficient of -0.151 which indicates that when teachers handle fewer lessons the academic performance is higher but when the number of lessons handled by teacher exceeds the limit set by TSC the academic performance declines.

Conclusion

The study found out that there was huge teacher shortage in Kuria East of about 60% and Kuria West of about 50% which accounted for failure in academic performance of up to 60%. This is attributed to enhanced teacher- student interaction in the classroom and even in the school as the teacher could get time for individualized attention which took care of the learner differences. Teacher utilization also revealed a positive relationship with academic performance whereby schools which utilized the available teachers optimally realized better academic performance and vice versa.

RECOMMENDATIONS

On the bases of the conclusions made from the study, the researcher recommended the following:

- The government should employ more teachers to bridge the gap of over 60.58% teacher shortage in Kuria East and 50.1% shortage in Kuria West and ensure that those

who are already employed are not overworked.
- The government should employ only the teachers whose subject combinations are in shortage in schools to avoid overcrowding of teachers in a given department as other departments remains in deficit for instance the government should employ more science teachers than humanity teachers in both Kuria East and Kuria West to reduce the number of lessons taught by the same teachers per week to optimum levels.

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